DOCUMENT RESUME

ED 382 378 PS 023 267

AUTHOR Prentice, Mary
TITLE Catch Them Learning: A Handbook of Classroom Strategies. K-12.
REPORT NO ISBN-0-932935-79-6
PUB DATE 94
NOTE 127p.
AVAILABLE FROM IRI/Skylight Publishing, Inc., 200 East Wood Street, Suite 274, Palatine, IL 60067 (Item no. Z1254, $17.95, plus $5 shipping. Orders under $50 must be prepaid. Illinois residents must add 8.25% sales tax).
PUB TYPE Books (010) -- Guides - Non-Classroom Use (055)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS Art History; Change; *Classroom Techniques; Disabilities; *Elementary School Curriculum; Elementary Secondary Education; Interdisciplinary Approach; Leadership; Science Activities; *Secondary School Curriculum; *Teaching Methods; *Thinking Skills; *Units of Study; Writing Skills

ABSTRACT

This handbook is designed to help teachers teach thinking skills to elementary and secondary school students, and is based on a six-part model of teaching and learning adapted from J. Chaffee's "Thinking Critically" (1990). It highlights the key elements of teaching (to motivate students to think, to integrate the curriculum, and to help students associate in groups) along with the key elements of learning (to activate the process, to demonstrate thinking and learning skills, and to communicate new knowledge to others). The handbook includes seven sample interdisciplinary units that emphasize thinking skills that are appropriate for different grade levels. The units focus on the nature of change, domestic animals, art history, ocean voyages, disabilities, leadership, and writing about science. (Contains 80 references.) (MDM)

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CATCH • THEM LEARNING

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A Handbook of Classroom Strategies

Mary Prentice

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CATCH THEM LEARNING

A Handbook of Classroom Strategies

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IRI/Skylight Publishing, Inc.
Palatine, Illinois

Catch Them Learning: A Handbook of Classroom Strategies
First Printing

Published by IRI/Skylight Publishing, Inc.
200 E. Wood Street, Suite 274, Palatine, IL 60067
800-348-4474 or 708-991-6300
FAX 708-991-6420

Creative Director: Robin Fogarty
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Library of Congress Catalog Card Number: 94-78534
Printed in the United States of America.
ISBN 0-932935-79-6

1266-10-94

Dedication

To: Thomas
Renie
Daniel
Each knows full well why.

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Preface

This book is not the product of one person alone. Several teachers at various levels in different states joined efforts to write this book. We aim to share our teaching experiences with other teachers. We do not intend to be THE ANSWER to the complexities of the educational community. We have struggled to present the basics without becoming too simplistic. We have focused on the student-teacher relationship and learning together. And we have sought to teach teachers how to help students become their own best teachers for life.

"If a man is fortunate he will, before he dies, gather up as much as he can of his civilized heritage and transmit it to his children" (Durant & Durant, 1968).

—Mary Prentice
April 25, 1993

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A Word about Parents and the Community

Parents and community members must understand the changes occurring in schools. Educators, however, under the pressure of countless demands, often fail to provide timely information to their public. Parents and members of the community need to be informed.

As you plan how to incorporate the strategies in *Catch Them Learning*, you should also plan how you will communicate these strategies and their advantages to the public and parents. Do not assume parents and community members will get the message if you explain the new methods one way, one time. Education is a jargon-loaded field often receiving bad press. The public is genuinely concerned.

Your local situation will determine what steps you will take to inform the public, but the ultimate goal is to communicate clearly. You may communicate through letters, parents' meetings, newspaper articles, invitations to observe the classroom, and portfolios or exhibitions.

You will know what is most effective in your community. Public support and community understanding will not only help the students, it will help you and your school's image.

INTRODUCTION

Teaching Thinking: Another Fad or a New Foundation?

> "We now know that individuals have very different kinds of minds, that they learn in different kinds of ways, and that they can even demonstrate their knowledge and understanding in characteristic ways. Because these findings are quite well established, it becomes educational malpractice to continue to serve education in the same way to all consumers. Rather we are challenged to find the optimal means to address each child, and to remain ever-vigilant to new and better ways to educate that child to his or her fullest potential" (Gardner, 1983, p. 17).

Gardner's words and the words of other educational reformers challenge teachers to improve their teaching methods. To accommodate students' "different kinds of minds" and to help them realize their full potential, teachers are trying to make sense of what lies beneath any new educational strategy. They ask, "Is the teaching of thinking just another fad or is it perhaps a new foundation?"

Why Teaching Thinking Is Important

This book asserts that teaching students how to think is *not* another fad. Teaching thinking is an essential foundation for developing the minds of tomorrow's adults. This belief is derived from three premises:

- Educators must confront the *rate of change*, rather than *change*. We simply must find more efficient ways of accomplishing our goals.

- Science and other disciplines have provided new information about how the brain functions and thinking occurs. This significant contribution has direct implications for the teaching of thinking.
- The explosion of the knowledge base in a technological world requires that we teach students to use their minds well.

The first premise is that educators must confront the rate of change in our society. Many of the adults teaching today's students grew up in a fairly stable, safe world. Nonetheless, their students live in a world where (Fisher, 1992):

> Every 8 seconds of every day, a child drops out of school.
>
> Every 47 seconds of every day, a child is abused or neglected.
>
> Every 67 seconds, a teenager has a baby.
>
> Every 7 minutes, a student is arrested for a drug offense.
>
> Every 30 minutes, a child is arrested for drunken driving.
>
> Every 36 minutes, a child is killed or injured by guns.
>
> Every 53 minutes, a child dies because of poverty.
>
> Every day, one of five school-age children comes to school hungry.

The Children's Defense Fund of the National Association of Children's Hospitals and Rehabilitation (March 1994, p. 4–5) substantiates Dr. Fisher's statistics with its own findings:

> Nearly 50,000 children were killed by firearms between 1979 and 1991. This is equal to the number of American battle casualties in the Vietnam War.
>
> In 1991, 5,261 children and teenagers died as a result of firearm injuries.
>
> Every two hours a child dies from gunshot wounds.
>
> Guns are the number one cause of death among 10- to 24-year-old black males and the number two cause of death among all 10- to 14-year-olds.
>
> Every day, 30 children are injured by gun violence.
>
> The average hospitalization cost for a child injured by a gun is $14,434—enough to pay for a year of college.
>
> Every day, 1.2 million latchkey children come home to houses in which there are guns.

These vast societal changes have taken a toll not only on children, but also on the educational system. Some teachers have either left the profession or are secretly the counting the years to early retirement. "One-half quit before completing five years in the classroom" (Goodlad, 1990, p. 4). Other educators have tried to respond to the rate of change, the new symbols, the new terminology, and the new approaches. They have made mistakes. These teachers will either learn from their mistakes or give up teaching in despair.

Our second premise is that science and the other disciplines have provided new information about how the brain learns. This information has direct implications for the teaching of thinking. The medical and scientific communities have studied how the brain thinks. Their evidence links learning with the teaching of thinking. While the knowledge is admittedly incomplete, there is conclusive evidence that the brain continually remodels itself. The brain has the innate ability to search for meaning through patterning.

The brain is indisputably a multipath, multimodal apparatus. The notion of mandatory sequences, or even fixed sequences, is insupportable. Each of us learns in a personal, highly individualized, mainly random way, always adding to, sorting out, and revising all the input from teachers or elsewhere that we have had up to that point. Therefore, any group instruction that has been tightly, logically planned will have been wrongly planned for most of the group, and will inevitably inhibit, prevent, or distort learning (Hart, 1983, p. 55).

Cognitive scientists have heightened our awareness of the need to change the way we teach. Dr. Edward Hall's classic work, *Beyond Culture*, asserts that the rigid barriers between disciplines should be removed. It also raises the issue that present practices must prepare students for their future.

Dr. John Bransford, in *Human Cognition: Learning, Understanding, and Remembering* (1979), formulates and vigorously tests explicit theories of learning. He explains that humans develop skills by linking current information with previously acquired knowledge. His influence can be seen in a popular text, *A Different Kind of Classroom: Teaching with Dimensions of Learning* (Marzano, 1992).

> "The first step in learning declarative knowledge is constructing meaning. The learner does this by linking old knowledge with new knowledge, making predictions, verifying them, and filling in a lot of unstated information" (Marzano, 1992).

Educators must incorporate this new information about how the brain learns, and teach students how to think. Educators have partnered with the scientific community to find methods that teach students to use their minds well. Many now recognize individual differences in learning styles and know how to accommodate various intelligences.

While scientists have focused on how the brain patterns and stores information, educators have meticulously explored what intelligence is and how to assess it. *Making Connections: Teaching and the Human Brain* is an excellent example of how a bridge has formed between these two disciplines: "Brain-based learning involves acknowledging the brain's rules for meaningful learning and organizing teaching with those rules in mind" (Caine & Caine, 1991, p. 4).

The third premise is that the explosion of technology and the knowledge base requires that we teach children to use their minds well. We must prepare students for a world we can only dimly imagine. According to John Naisbitt, author of *Megatrends* (1991), the knowledge base doubles every nine hundred days. With this rate constantly increasing, the future is beyond our wildest imaginations. It is no longer possible to live in isolation. Like it or not, we are part of a global economy. Today's students will be employed in job categories in a world of many languages. As educators, we must realize that today's students will not live in the world as we know it.

How We Can Teach Thinking

The task before the educational community now becomes to examine the evidence on brain research and incorporate the evidence into new teaching methods. We must review our methods of teaching thinking to accommodate the brain's natural tendency to learn if we are to meet the vast societal and technological changes. If brain research and instructional methodology are not reviewed and applied, there will be no solid foundation for learning.

We have reviewed numerous approaches to the teaching of thinking and are acutely aware of the myriad spectrum. The reader is invited to investigate these methods in other texts. (A good reference is *Developing Minds: Programs for Teaching Thinking*, Revised Volume 2, edited by Arthur L. Costa.)

This book, *Catch Them Learning*, incorporates a model for teaching thinking that is adapted from John Chaffee's definition: "Thinking is our active, purposeful, organized effort to make sense of the world" (Chaffee, 1990, p. 1) and from four fundamental and inseparable constructs: students must be actively engaged in their own learning (Chaffee, 1990); learning activities must be purposeful and focused on the desired goals and outcomes (Chaffee, 1990); students must have the skills and strategies required to organize their efforts to achieve their goals (Chaffee, 1990); and understanding self and others is fundamental to maximum use of the mind and making "sense of the world."

INTRODUCTION

When teachers plan instruction based on the definition and the four constructs, students become actively engaged in the learning process. Students make choices and become increasingly more responsible for their own learning. They begin to recognize that their learning has purpose and value because it is authentic and articulated. Because the learning process is organized, students must learn certain skills or strategies to achieve their goals. In addition, the students interact in a variety of groups to understand themselves and others.

As we have developed this book, we have used the definition and the constructs to formulate a six-part model for teaching thinking. These components can be transposed, but no one component can be deleted; for like a domino effect, if one component falls, the framework collapses and becomes deficient in purpose and meaning.

The first three components focus on teacher-initiated responsibilities:

MOTIVATE, techniques for motivating students;

INTEGRATE, strategies for integrating curricula across the disciplines; and

ASSOCIATE, suggestions for a variety of grouping patterns within the integrated framework.

The second three components focus on student-centered responsibilities:

ACTIVATE, students become actively engaged in the learning process;

DEMONSTRATE, students give evidence of their learning; and

COMMUNICATE, students share their learning with others.

If this model is correct and accepted, the terms within the foundation become more than slick phrases or jargon. "Real-world experiences," "authentic learning," "meaningful assessment," and "cooperative learning" are not mere terms or symbols of a fad. They represent a new foundation for education. This foundation answers the ultimate questions—How might we teach more efficiently to accommodate the brain? How might we teach students to use their minds well?

> "Mind gives us meaning and direction and the possibility of progress over time. Mind orchestrates the realization of the brain and binds consciousness and unconsciousness together" (Restak, 1988, p. 31).

How to Use This Book

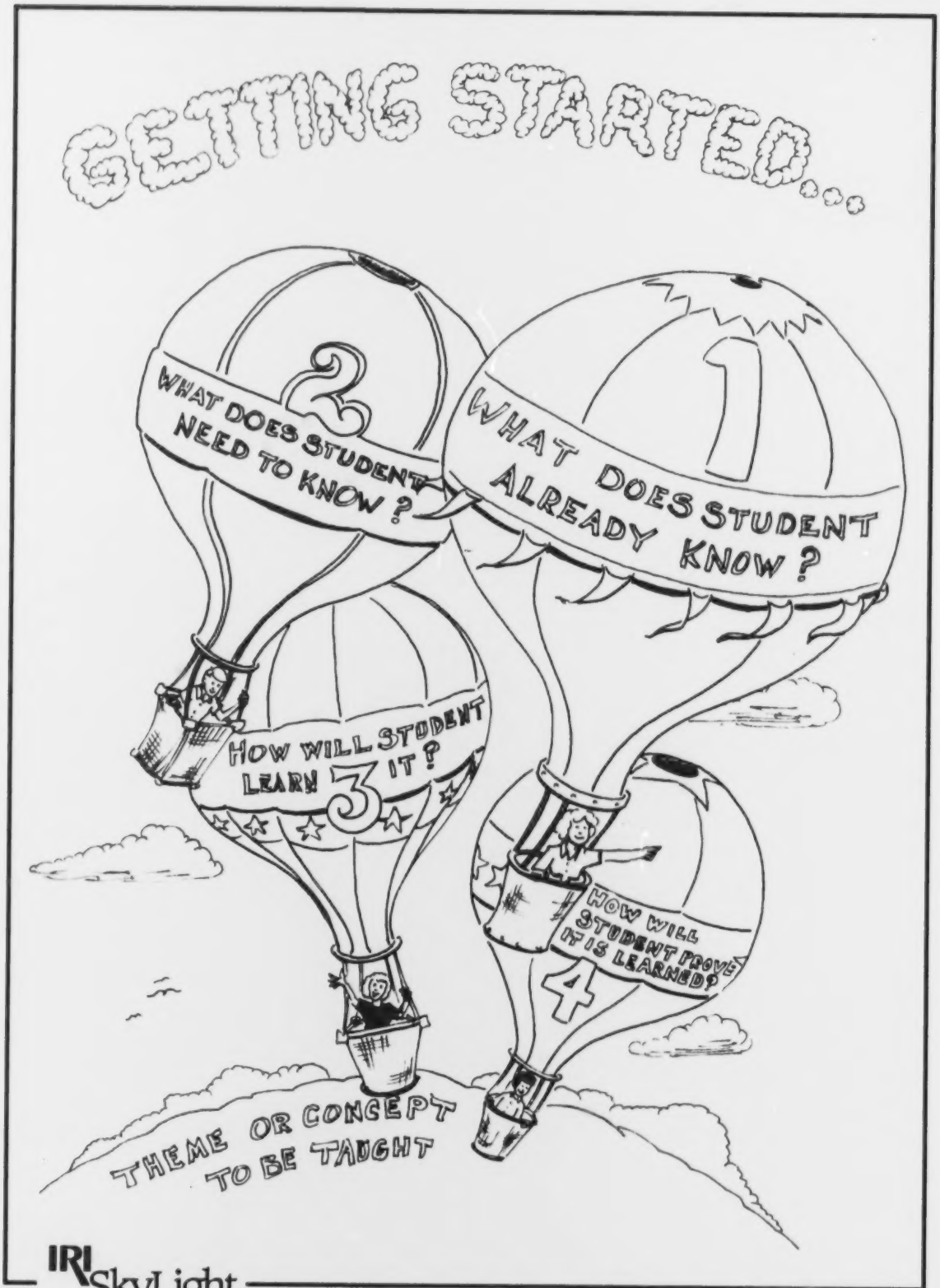
Part One explains the six key elements of teaching and learning. These chapters help the reader understand the six elements. The first three chapters highlight the key elements of teaching—to *motivate* students to think, to *integrate* the curriculum, to help students *associate* in groups. The next three chapters highlight the key elements of learning—to *activate* the process, to *demonstrate* thinking and learning skills, and to *communicate* new knowledge to others.

Part Two comprises a collection of units appropriate for each of the grade levels. Units were written by and for teachers. There is a wide range of formats, details, and number of activities, because the motivate-integrate-associate-activate-demonstrate-communicate (M-I-A-A-D-C) model is meant to be the servant, not the dictator, of teachers. The diversity of the units reflect the model's flexibility. Yet all of the units remain acutely focused on its fundamental principles: students are actively engaged in their learning experiences, and the activities are purposeful and organized with the goal of understanding self and others.

Although the units are designated for specific grade levels, they can be adapted for other age groups. Teachers can benefit by reviewing each unit, selecting appropriate activities for their grade level, and generating new activities. Thus, these units become springboards or extensions for developing unique and original units. The units provide teachers with a rich bank account of ideas for serving the interests of their students, assessing their needs, and accommodating their differences. The resources, ideas, and activities included in the units help the teacher interact with the variety of students' abilities and interests.

Catch Them Learning incorporates real world experiences, the latest research, and solid teaching methods that are foundational to educational reform. The book answers the question—How might we teach students to use their minds well?

***The next page contains a blackline. The teacher may use the blackline to demonstrate the M-I-A-A-D-C model to students or parents, or the teacher may use it as a guide in team curriculum planning or individual unit planning. The blackline serves as a prompt that particularly helps visual learners understand the concepts presented in each chapter.



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Part One: The Key Elements

of Teaching...

MOTIVATE p. 3

INTEGRATE p. 9

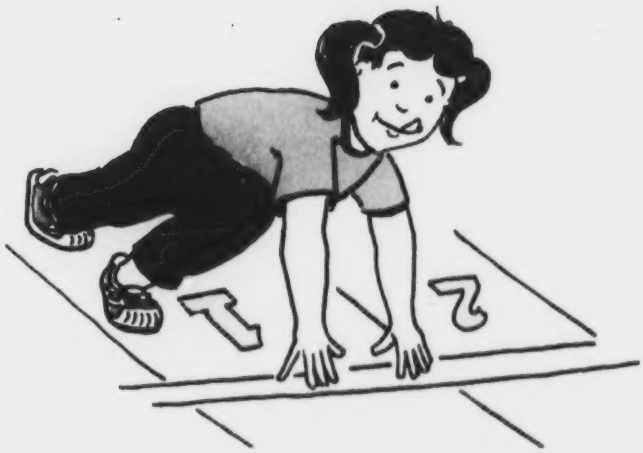
ASSOCIATE p. 19

and Learning...

ACTIVATE p. 25

DEMONSTRATE p. 33

COMMUNICATE p. 39



MOTIVATE

Motivate

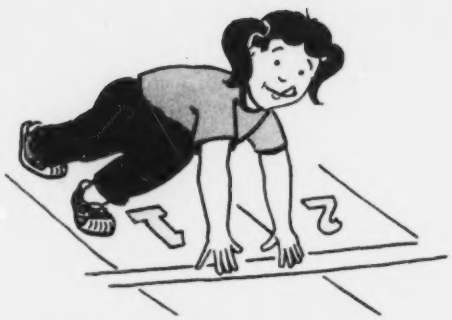
Learning must be approached
from the students' perceptions.

Learning must be related
to real-world experiences.

Learning must progress from
the known to the unknown.

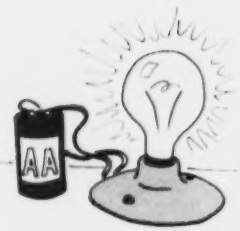
Learning must create
a sense of student ownership.

Learning must have
value for the students.



MOTIVATE

Motivation is "'what' energizes or directs a learner's attention, emotions, and activities" (Borich, cited in Farris, 1990, p. 22). For decades, teachers have continuously sought the elusive "what" to energize students. Teachers are painfully aware that without the "what," a child's potential to grow intellectually or emotionally will be diminished. This chapter focuses on leaping over this large hurdle by providing ideas for opening doors to the mind.

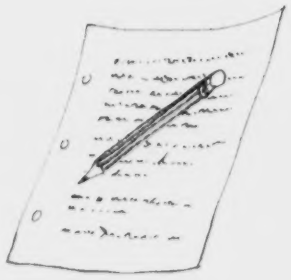


To motivate students, teachers can approach subject matter from the student's perceptions and his or her real-world experiences. Before students will commit to the learning process, they must understand the value of their learning. They must understand the long-range implications and possible applications of any newly acquired information or skills. They must realize that over time, skills acquired in the classroom will become assimilated into a personalized knowledge base.

When introducing a new topic, theme, or unit, teachers may use any number of strategies to help students understand why they need to assimilate the new information. One example is focusing questions. Focusing questions can be used to initiate or generate student discussions about teacher-selected topics. Teachers can use these questions to understand what students already

know or feel about the topic. They can use this insight to help students link their prior knowledge to new aspects of any selected topic. Essentially, this student-focused approach helps the student progress from the known to the unknown. One popular technique uses the following four basic questions:

1. What do you already know about this topic?
2. What would you like to know about it?
3. How could you learn it?
4. How will you prove you've learned it?



This process serves two purposes. First, students realize they already know something about the topic and are not starting from ground zero. Starting with what students already know fans the flames of learning and creates a sense of excitement in the students. The importance of this can hardly be overstated. Students also gain a sense of ownership and realize "My ideas, my choices, and my interests are valuable." Second, the teacher gains the insight necessary for sound instructional planning. Once the teacher determines what the class knows, he or she can tie the subject matter or concepts to what students already know. For example, if a teacher chooses to teach the Legacies Unit (p. 81), he or she might open with these questions: Do you know a person society might refer to as "disabled"? Where do you suppose this term comes from? How do you think the term makes the person feel? How would you feel if someone were to refer to you as "disabled"?

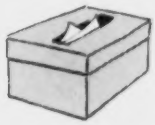
Guided by the students' responses, the teacher can link students' ideas to the concepts of the unit. When students identify real people or real-life situations associated with the topic, they will be more interested and motivated to learn. They will become personally invested in the learning process.

Teachers may use a variety of techniques to record student learning. No matter what technique is chosen, it should give students a "before and after" glimpse of their learning. Some teachers have successfully used mind mapping. Mind maps benefit younger children and visual learners. Students can draw a "before" and "after" mind map of the topic. When they compare mind maps, they can *see* what they know and what they have learned about a topic. Some teachers have used individual journal entries or group discussions to record responses. Remember, the important thing is to provide students with a "before and after" visual representation so students see how much they have learned.

Summary

Motivation starts with ascertaining what children already know and have experienced. It moves from the known to the unknown. By asking the four basic questions, teachers obtain valuable information for developing exciting and enriching activities that create a sense of student ownership. The teacher becomes a guide, assisting students toward personal ownership of learning. Students learn because they want to learn. After all, it was partly their idea!

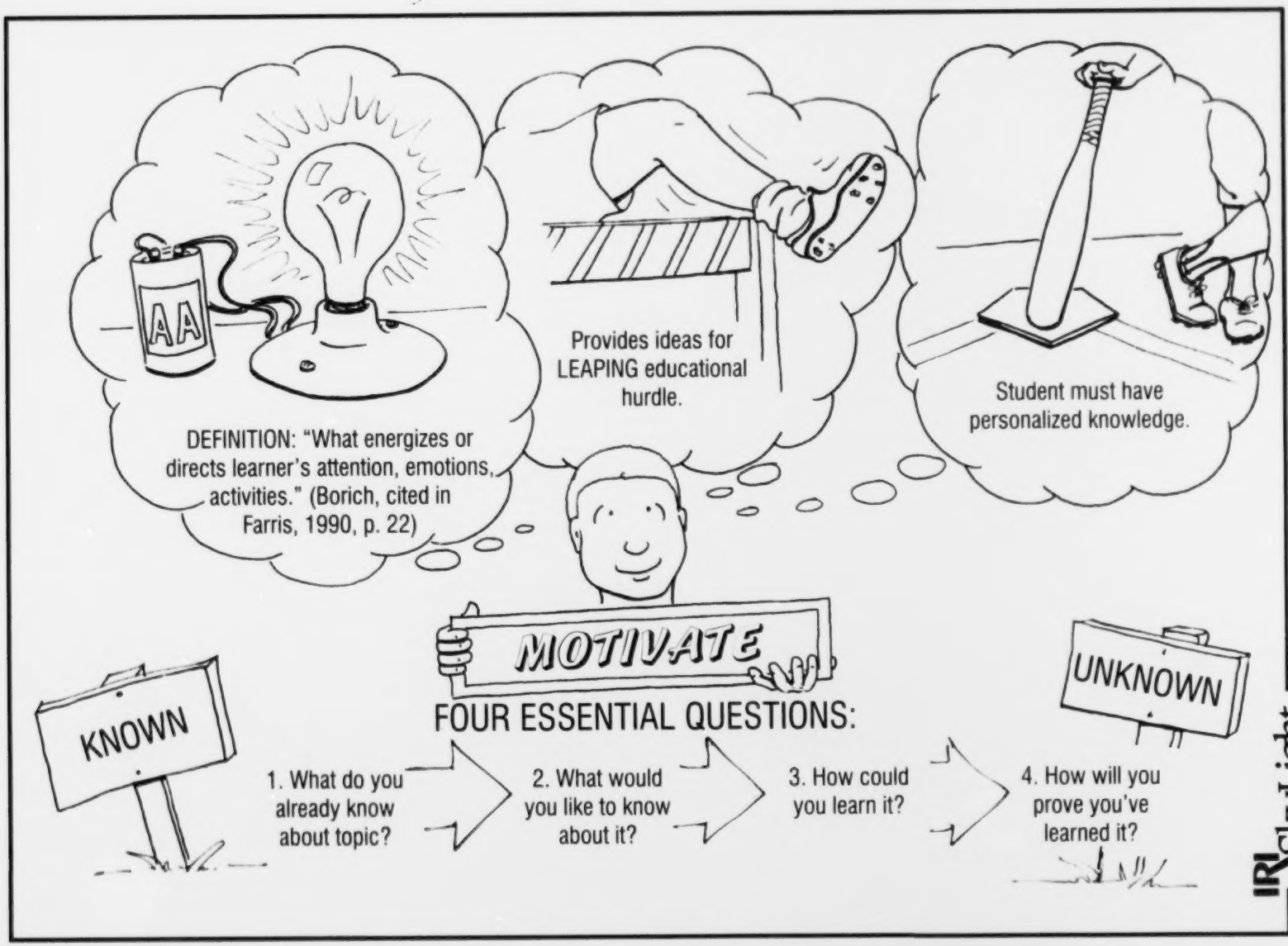
Suggestions



Next time you start a new topic, try the four basic questions (p. 6) and note any changes in the students' responses to the task.

1. Did you get valuable information to help you plan? to group students? to focus the topic more effectively?
2. Did students gain a greater sense of ownership in the learning process?
3. How might you bring the shy, the introverted, and the uninvolved into the process?
4. How else might you provide students with a visual representation of their learning?

***The next page contains a blackline. The teacher may use the blackline to demonstrate the M-I-A-A-D-C model to students or parents, or the teacher may use it as a guide in team curriculum planning or individual unit planning. The blackline serves as a prompt that particularly helps visual learners understand the concepts presented in each chapter.


AA
DEFINITION: "What energizes or directs learner's attention, emotions, activities." (Borich, cited in Farris, 1990, p. 22)
Provides ideas for LEAPING educational hurdle.
Student must have personalized knowledge.
MOTIVATE
KNOWN
UNKNOWN
FOUR ESSENTIAL QUESTIONS:
1. What do you already know about topic?
2. What would you like to know about it?
3. How could you learn it?
4. How will you prove you've learned it?

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INTEGRATE

Integrate

Learning is linked
to previous knowledge.

Learning is transferred and
applied from one discipline
or problem to another.

Students learn how to learn
through the interconnectedness
of various subjects.

INTEGRATE

As cited in the Motivate chapter, students remember best when they connect new ideas and concepts with their own personal experiences. The more ways a student can connect a personal frame of reference to new learning, the firmer the learning.

Integration refers to interconnections among subjects. Teachers already practice integration in numerous ways including whole language, thematic teaching, unit approach, or cross-disciplinary teaching.

Thematic Integration

While there are numerous approaches or methods for integration, each teacher will probably be more comfortable with one than another. Two suggestions for thematic integration follow:

1. Teachers may elect to fully explore a theme in a single subject and refer back to the theme throughout various lessons in different content areas. This helps students to connect a single theme from one subject to different subjects and promotes the understanding of the theme. This method requires careful thought on the part of the teacher. He or she must consciously seek and incorporate references during various lessons. For example, the teacher may choose the theme "families" and fully explore

that concept in social studies. He or she would also incorporate the family theme in other subject areas through the discussion of word families in language arts, number families in mathematics, and biological families in science.

2. Teachers may choose to integrate a theme holistically and entirely throughout three or more subject areas. This approach requires greater curricular modification in content and timing than the previous one. For example, given the theme "families," teachers may choose to fully explore the topic in social studies through various activities that define and expand a student's understanding of family. In addition, the concept of family may be the focus during language arts by reading books dealing with families. Fine arts may be chosen as the third curricular area for this exploration as students study various artistic schools—realism, impressionism, etc.

Intelligence Integration

In addition to integrating subjects, teachers need to cultivate the students' wide range of intelligences. One method that ensures that multiple intelligences be addressed is by adhering to Howard Gardner's "Seven Forms of Intelligences." In his 1983 publication, *Frames of Mind*, Gardner delineates seven different types of intelligence.

Verbal/linguistic intelligence includes all forms of language production including speaking, reading, writing, and linking processes required for linguistic activities.

Logical/mathematical intelligence includes both inductive and deductive reasoning processes.

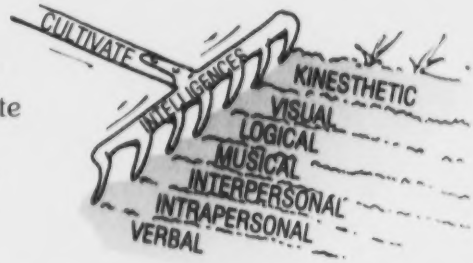
Visual/spatial intelligence includes the visual arts, navigation, map making, architecture, games that require visualization from various perspectives, and any activities that require sight or the ability to form mental images.

Bodily/kinesthetic intelligence includes using the body to express emotion, to play games or sports, or to invent new products or activities.

INTEGRATE

Musical/rhythmic intelligence includes recognizing and using rhythms and tonal patterns, and sensitivity to sounds from the environment, human voices, and musical instruments.

Interpersonal intelligence includes the ability to work cooperatively in a group, to communicate verbally and nonverbally, and to notice distinctions in mood, motivation, and temperament of others.



Intrapersonal intelligence includes knowledge of the internal aspects of one's own spirituality, feelings, emotions, thinking processes, and intuition.

Using Howard Gardner's Multiple Intelligences theory and incorporating several disciplines within the scope of one unit or theme will facilitate integrated learning for all types of students. Gardner's list of intelligences can serve as a checklist to ensure that students have the opportunity to experience their strengths and develop their weaknesses in any of the intelligence types.

One common human tendency many of us share is getting in a rut. We tend to repeat what has worked in the past or what makes sense from our perspective. Employing Gardner's list of intelligences can help us see if we are in a rut and remind us to approach activities from many perspectives.

Integration of all seven intelligences into various subject areas is not as difficult a task as it sounds. It may be facilitated with relative ease through the use of the Grid of Multiple Intelligences and Subjects on page 12 (Figure 1), which cross references subjects and multiple intelligences. Additional grids using the topic are included as specific examples (Figures 2 and 3). You will notice all of Gardner's intelligences are addressed within three appropriate subject areas.

The purpose of integration is threefold:

- Students learn to transfer learning from one discipline to another.
- Students learn to apply their learning from one problem-solving setting to another within both academic and real-world situations.
- Students gain knowledge in areas beyond the subject at hand, providing them with a means or method for acquiring and applying knowledge.

Figure 1—The Grid of Multiple Intelligences and Subjects

CONCEPT _____ GRADE LEVEL(S) _____

FOCUSING QUESTION _____

	Social Studies	Math	Language Arts	Science	Physical Education	Fine Arts
Verbal/ Linguistic						
Logical/ Mathematical						
Visual/ Spatial						
Bodily/ Kinesthetic						
Musical/ Rhythmic						
Interpersonal						
Intrapersonal						

Figure 2—Sample Multiple Intelligences Grid for a K-2 Classroom

CONCEPT *Family* GRADE LEVEL(S) *K–2*

FOCUSING QUESTION *What is a family?*

	Social Studies	Math	Language Arts	Science	Physical Education	Fine Arts
Verbal/ Linguistic	Tell a story about a family.		Possible books: *Peter Rabbit*, *My Daddy Embarrasses Me*			
Logical/ Mathematical						Use mathematical number families to create a collage showing number relationships.
Visual/ Spatial	Count and draw members of their family.					
Bodily/ Kinesthetic	Role play how members of a family interact.					
Musical/ Rhythmic						Create or find a musical/ rhythmic pattern that depicts "family."
Interpersonal		Create graph showing number of family members.	Invite a family member to school. Tell about family members.			
Intrapersonal					Think about a family tradition (game or activity) and share it with classmates.	

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Figure 3—Sample Multiple Intelligences Grid for a Grade 3-5 Classroom

CONCEPT *Family* GRADE LEVEL(S) *3–5*

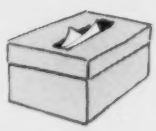
FOCUSING QUESTION *What is a family?*

	Social Studies	Math	Language Arts	Science	Physical Education	Fine Arts
Verbal/ Linguistic	Choose a character from another era and write journal entries of his or her activities.		Possible books: *Sarah Plain & Tall*, *A Gathering of Days*			
Logical/ Mathematical			Select a problem faced by a character from a book and create three possible solutions.			
Visual/ Spatial	Study and design a floor plan.					
Bodily/ Kinesthetic	Learn a game played by families in another culture.					
Musical/ Rhythmic					Learn a dance done by children in another culture.	
Interpersonal						As a group, make a collage about families.
Intrapersonal						Plan and create a pictorial graphic time-line representing own life to date.

Summary

Integration refers to the interconnections of subject matter. Using Gardner's (1983) seven intelligences within the integration process facilitates learning for all types of learners. By connecting several subjects within the scope of one concept, teachers can integrate topics across disciplines. The integration allows students to draw on previous experiences to support their learning. Students learn to transfer and apply learning between disciplines. In short, through integration of subjects and modes of learning, students learn how to learn as they experience the interconnectedness of the various subjects.

Suggestions



After you review Figures 2 and 3, take one of your own units and chart it on a copy of Figure 1.

1. Did you find the grid useful in planning your unit?

   Are there subjects that need additional activities?

   Are there intelligences that have been neglected?

2. Does the grid provide insight into areas that need additional attention?

3. Did the grid save you time in planning?

***The next page contains a blackline. The teacher may use the blackline to demonstrate the M-I-A-A-D-C model to students or parents, or the teacher may use it as a guide in team curriculum planning or individual unit planning. The blackline serves as a prompt that particularly helps visual learners understand the concepts presented in each chapter.

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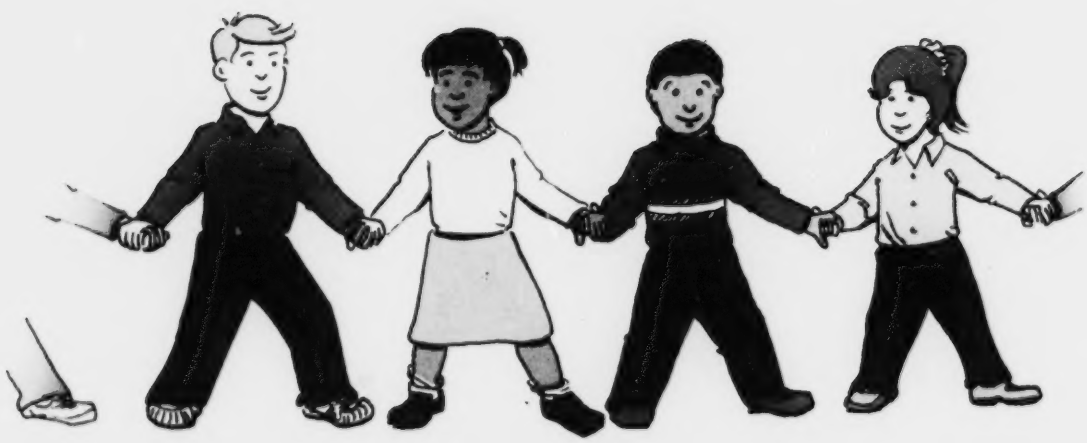


ASSOCIATE

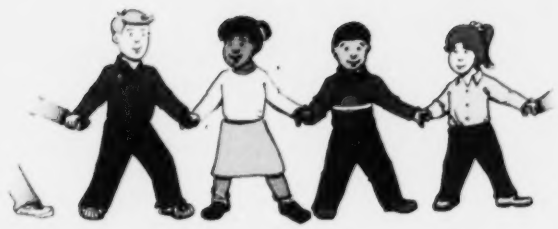
Associate

Teachers need to make deliberate grouping decisions.

Students need experiences with different types of grouping patterns.

Grouping patterns foster essential skills needed for successful learning and living.

Grouping patterns should facilitate instructional objectives and be compatible with selected activities.

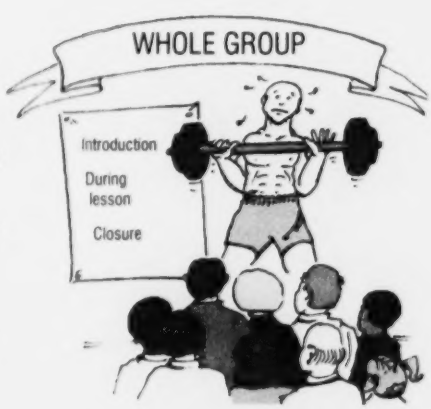


ASSOCIATE

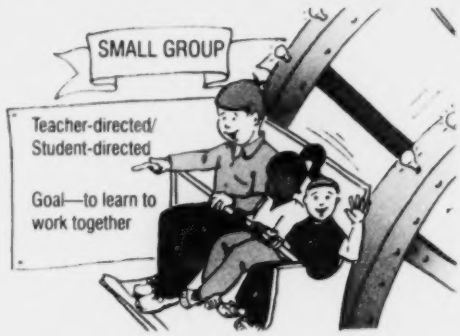
As explained in the Integrate chapter, students need activities that tap multiple intelligences so they may expand their ability to transfer learning. One way to do this is to have students work in groups. Teachers can maximize student potential through employment of student groups. Prior to the onset of instruction, teachers can consciously decide on the types of grouping to be used and ensure their use throughout a unit. These decisions are based on teacher assessments of each student's academic strengths and weaknesses, student learning styles, and each individual student's ability to work productively in different group types. The selected grouping patterns should facilitate the objectives of instruction and be compatible with the activity being addressed.

Associate refers to instructional settings through which a student may learn. Settings include whole group, small group, pair-share, and individual learning.

Whole group refers to instructional settings in which the entire class attends to, and participates in, the same activity at the same time. The whole group setting is often preferred during the introduction of the lesson for initial brainstorming sessions or for ascertaining the collective knowledge of the class. It may also be used during the lesson when critical concepts are introduced or during the closure of the lesson.



Small groups include three to five members who work on assigned or self-generated projects or demonstrations with minimal structuring. Some cooperative learning groups assign specific roles for each member of the team. The groups can be teacher- or student-directed. This grouping pattern is appropriate for projects, demonstrations, experiments, or interpersonal skill lessons. The underlying goal for small groups is for students to learn to work together. It is important for students to work together because as adults they must be capable of cooperating to achieve specific objectives.



In *pair-share*, students may work with a partner on a project or ask the partner to critique the product and offer suggestions for improvement.

Finally, *individual instruction* is used for reteaching specific skills, assessing individual achievement, working independently on self-selected topics or projects, and working with intrapersonal skills lessons.

David Lazear (1991) reminds educators that grouping decisions should always be linked to the instructional goals of specific lessons.

- Teachers must consciously bring higher-order thinking and reasoning to a lesson so students learn to think and perform at higher levels.
- Teachers must provide strategies that unify the groups, creating what Johnson and Johnson (1991) call "positive interdependence."
- Teachers must structure each lesson to ensure individual learning and to discourage sloughing off by the students in group or individual work.
- Teachers must carefully and explicitly encourage students to employ social skills—listening, encouraging, taking turns, staying on-task, and using appropriate voice volume.
- Teachers must provide students enough time to think about and discuss both the lesson content and their behavior. This helps students realize that *they* are the key to their own educational success.

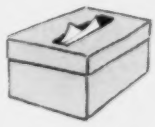
ASSOCIATE

Summary

Selecting what type of group and when to use each group is a conscious teaching decision, based on the teacher's assessment of the learners and the lesson objectives. Each student must participate in all types of groups, with varying group composition throughout the year.

Teachers are responsible for creating opportunities to develop higher-order thinking skills in each of the grouping patterns. Students should learn both cooperative and competitive skills and understand when it is appropriate to use each. The goal is for students to realize they need to strive for their personal best, regardless of the type of group or skill emphasized.

Suggestions



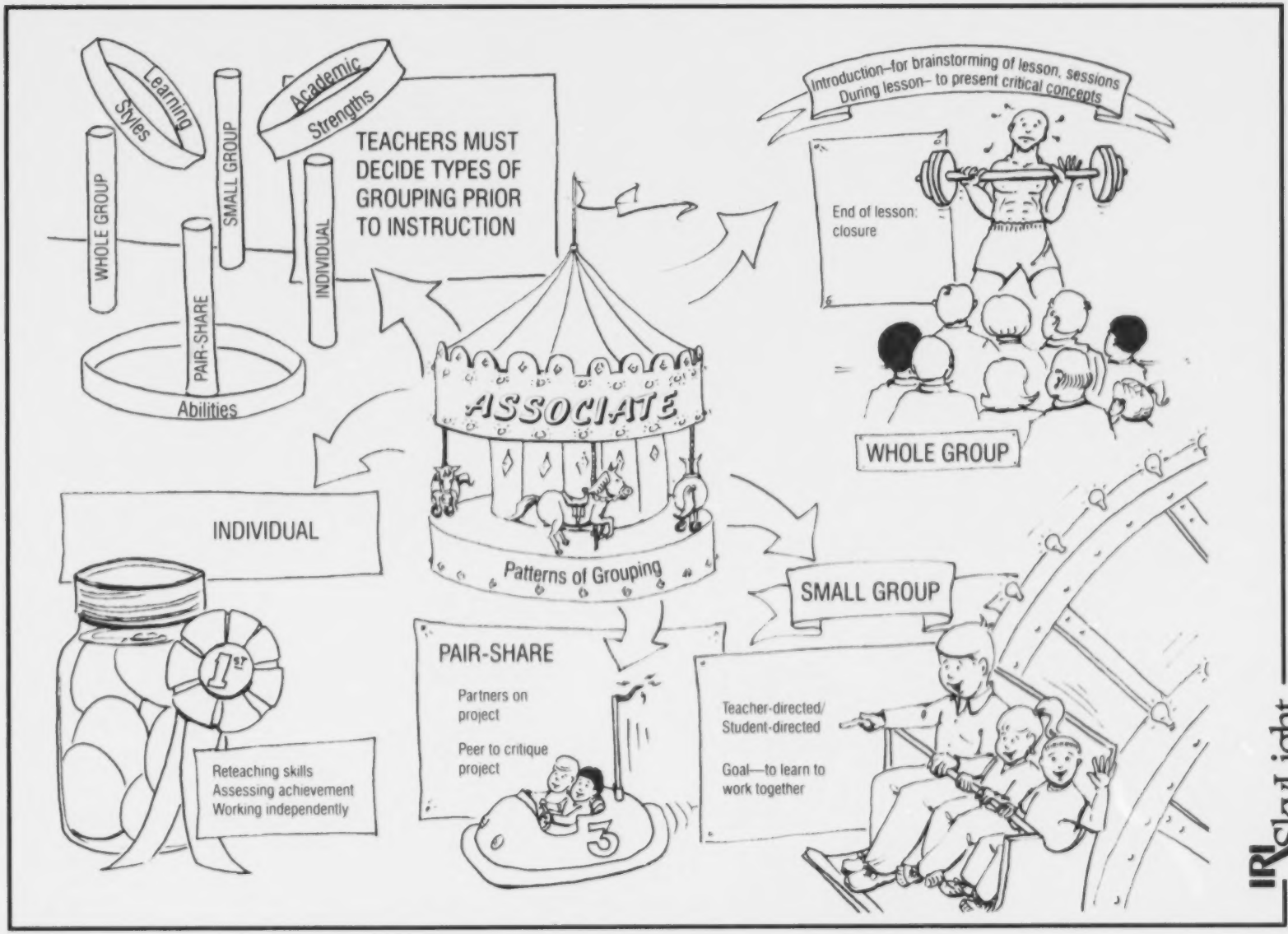
1. During the upcoming week, keep a tally of the times you use each of the following group types. This will assist you in discovering if you are in a teaching rut, using only one or two group patterns.
   - Whole
   - Small
   - Pair-Share
   - Independent

2. After recording the grouping types you used, consider the following:

   Did I use all grouping types to the best advantage?

3. If one type was used extensively, make a plan that includes using other groups in the upcoming week.

***The next page contains a blackline. The teacher may use the blackline to demonstrate the M-I-A-A-D-C model to students or parents, or the teacher may use it as a guide in team curriculum planning or individual unit planning. The blackline serves as a prompt that particularly helps visual learners understand the concepts presented in each chapter.


Learning Styles
Academic Strengths
WHOLE GROUP
SMALL GROUP
INDIVIDUAL
PAIR-SHARE
Abilities
TEACHERS MUST DECIDE TYPES OF GROUPING PRIOR TO INSTRUCTION
ASSOCIATE
Patterns of Grouping
Introduction–for brainstorming of lesson, sessions
During lesson– to present critical concepts
End of lesson: closure
WHOLE GROUP
INDIVIDUAL
Reteaching skills
Assessing achievement
Working independently
PAIR-SHARE
Partners on project
Peer to critique project
SMALL GROUP
Teacher-directed/ Student-directed
Goal—to learn to work together
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ACTIVATE

Activate

Learning is an active process.

Active learning addresses
a variety of learning styles.

Active learning addresses multiple
intelligences and varied subject areas.

Active learning involves a
variety of student groupings.

Active learning involves student choices.

Active learning involves constant
instructional assessment and decision making.

ACTIVATE

Researchers have determined that the more actively involved the student is with the learning, the greater the actual retention of the learning. "The brain does not automatically accept or record information from teachers. The brain is not a passive consumer of information. Instead, it actively constructs its own interpretations of information and draws inferences from it. The brain ignores some information and selectively attends to other information" (Wittrock, 1978, p. 101).

The Introduction explained some of the research on how the brain works. This information forms a strategic foundation for the teacher in the construction of effective units of study.

The Motivate chapter discussed how the brain uses prior knowledge to construct new learning. Teachers need to begin each unit with an activity to assess what the students already know about the topic. This creates the foundation on which both the student and the teacher will build the new learning.

The Integrate chapter explained that the teacher must choose how to connect or apply learning to similar ideas in different content areas. Integration helps the student realize that knowledge is not isolated, but rather weaves a rich tapestry from all our experiences.

The Associate chapter asserted that successful group and individual skills are necessary for every student's future. The chapter discussed a variety of possible grouping configurations and explained why it is important to use these varied approaches.

Once these three steps—motivate, integrate, and associate—are accomplished, the teacher is ready to *activate*. Activate includes eight steps.

1 *Step one—choose a concept.* First, the teacher chooses a concept. The concept can be a significant abstract, such as "change," "power," or "courage." Each concept will be applicable to several disciplines.

2 *Step two—choose a subject.* The teacher chooses subject areas to teach the selected concept. If the classroom is self-contained, the teacher could incorporate the theme in multiple subject areas. For example, the teacher may choose the theme "change." In social studies, he or she might focus on how countries change; in English, how characters in stories change; in music, how tempo can change; in science, how elements change; and in math, how currencies change. The subject areas would become woven into the overriding theme.

If the classroom is not self-contained, the teacher might choose a theme and teach it in one main subject area with reinforcement in other areas. For example, the English teacher could link the concept "power" to a short story unit with characters who displayed power over others. The science teacher could reinforce this concept by having students study the power of nuclear energy or the math teacher could introduce the power of economics or statistics.

3 *Step three—ask focusing questions.* The teacher asks him- or herself focusing questions. For example: What does the child need to know about the topic? What is it I want the students to learn about "change" in currencies, countries, or elements? These questions are the foundations of assessment.

4 *Step four—generate activities and select a grouping pattern.* The teacher generates a list of different activities that may help students learn about the concept. As the teacher develops these activities, he or she should consider which groupings will be appropriate: whole class, small group, pair-share, or individual. For example, if the activity includes writing a story, the teacher might choose any of the grouping patterns.

5 *Step five—consider learning styles and multiple intelligences.* The teacher considers the learning styles and multiple intelligences of his or her students. As the teacher develops activities, each of the learning styles—visual, auditory, kinesthetic—needs to be represented. Students need experience in their preferred styles,

but experience with the other learning styles will strengthen their underdeveloped abilities. Teachers should be careful not to overuse their own preferred learning style.

Teachers should also make sure multiple intelligences are incorporated in the lesson. The Grid of Multiple Intelligences and Subjects (Figure 1, p. 12) is very helpful in developing activities. Some teachers may prefer to use other organizational techniques such as mind maps or webbing to develop and differentiate activities relative to multiple intelligences and subject areas.

How a teacher plans or what planning method he or she uses is not the issue. What's important is that an organizational strategy be used to record the planning and development of specific activities to meet a range of criteria for the unit. Remember, it is not necessary to include every intelligence and every subject area in each unit.

A single activity can meet several needs at one time. For example, writing a song may address verbal/linguistic and musical/rhythmic intelligences. If songwriting is done individually, it may address the intrapersonal aspect of the student learning experience; if it is done in a group, the interpersonal aspect of the learning experience would be highlighted.

6 *Step six—check for balance.* The teacher checks to see if there is a balance in the number of activities addressing each style or intelligence. Using a form or checklist ensures that the teacher considers all styles of learning and intelligences.

7 *Step seven—give students a choice.* The teacher gives the students a choice in how they will learn. The importance of student-directed learning can hardly be overstated. Students may be given the chance to choose different activities or how they wish to accomplish a given assignment. Giving students choices establishes the active engagement of learning and creates a sense of responsibility and ownership in the learning process. For example, students may be allowed to choose their own groups and topics for writing and research, or select their own presentation style for the finished product (role play, song, oral report, etc.).

8 *Step eight—monitor progress.* The teacher acts as a facilitator who constantly monitors the students' progress toward the completion of the selected activity. The teacher assesses the need for individual, small group, and whole class assistance and schedules appropriately. While each student's choice is honored, the teacher provides the framework and expectations of behavior for completion of tasks and establishes the parameters.

When you have finished these steps you will have a complete unit. Remember, your most creative ideas will often come *only* after you have written down the obvious, the tried and the true. Do not censor your ideas while you work through this eight-step process. Also, keep in mind that students' creativity is encouraged when it is honored as a natural and anticipated part of the learning activities.

The wave of change in educational practice has often been perceived as a tidal wave. Riding this crest can be an exhilarating experience for teachers because the focus is no longer content- or teacher-centered. Rather, it is learner-centered.

On the surface, fitting these M-I-A-A-D-C puzzle pieces together so they form a whole picture may sound like an overwhelming task, but Part Two of this book provides examples of units developed by teachers at various levels.

A Word about Frameworks

Some states are engaged in the process of developing curriculum frameworks to replace basic skills checklists and/or behavioral objectives. Frameworks are state-level documents that describe the knowledge, skills, and processes of instruction that students are expected to use to demonstrate mastery of specific state learner outcomes. They are written at the district level by a committee of teachers.

The frameworks are divided into specific disciplines. In each discipline there are several specific strands, or categories. Under each strand, the frameworks provide specific learning expectations. These are essentially statements of what the students need to know.

For each expectation, the teacher committee must generate lists of learning activities to be used in the classrooms of their specific districts. The Activate steps of this model are compatible with the frameworks process. They provide a visual checklist for teachers writing curricula. Through the use of this checklist, teachers may carefully examine their brainstormed activities. They then note other disciplines that may be integrated, as well as identify learning styles and intelligences found in these activities. A balance of the types of activities with respect to intelligences, learning styles, and grouping choices will be achieved. This process will document the requirements of the state frameworks.

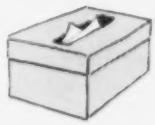
While Activate is the heart of the framework process, all other components are essential in creating a well-balanced curricular program. It is through the Activate steps that a scattered conglomeration of disconnected student activities may be transformed into a cohesive, understandable framework of learning. The goal of the frameworks is to allow teachers more flexibility to respond to the needs of individual students while providing a common focus for all students.

Summary

Students must be encouraged to stretch their skills and ideas. It is important for students to be versatile learners and not constantly rely on a single strength or learning style that is easy or comfortable for them. The teacher must consciously create a framework of activities from which a student or group of students can select or extrapolate a wide variety of meaningful learning opportunities. The teacher must structure or approve each activity to ensure individual learning. It is not enough to have a room full of active learners. The teacher must constantly monitor the type and level of student involvement in those activities.

For educators using this curriculum framework and for students receiving its benefits, knowledge becomes dynamic, alive, a reflection of life and its infinite possibilities.

Suggestions



1. Look at the mind map on page 30.

   Follow the activating steps and let your mind do the walking.

2. Consider a unit you are presently teaching. Can you trace it through the steps?

   Did this step-by-step process help you identify weaknesses in your present plan?

   Does this process seem a helpful way to plan a unit by yourself? with team members?

   Does this process save you time?

3. If you develop units as a team, did the team benefit from the increased idea bank of activities?

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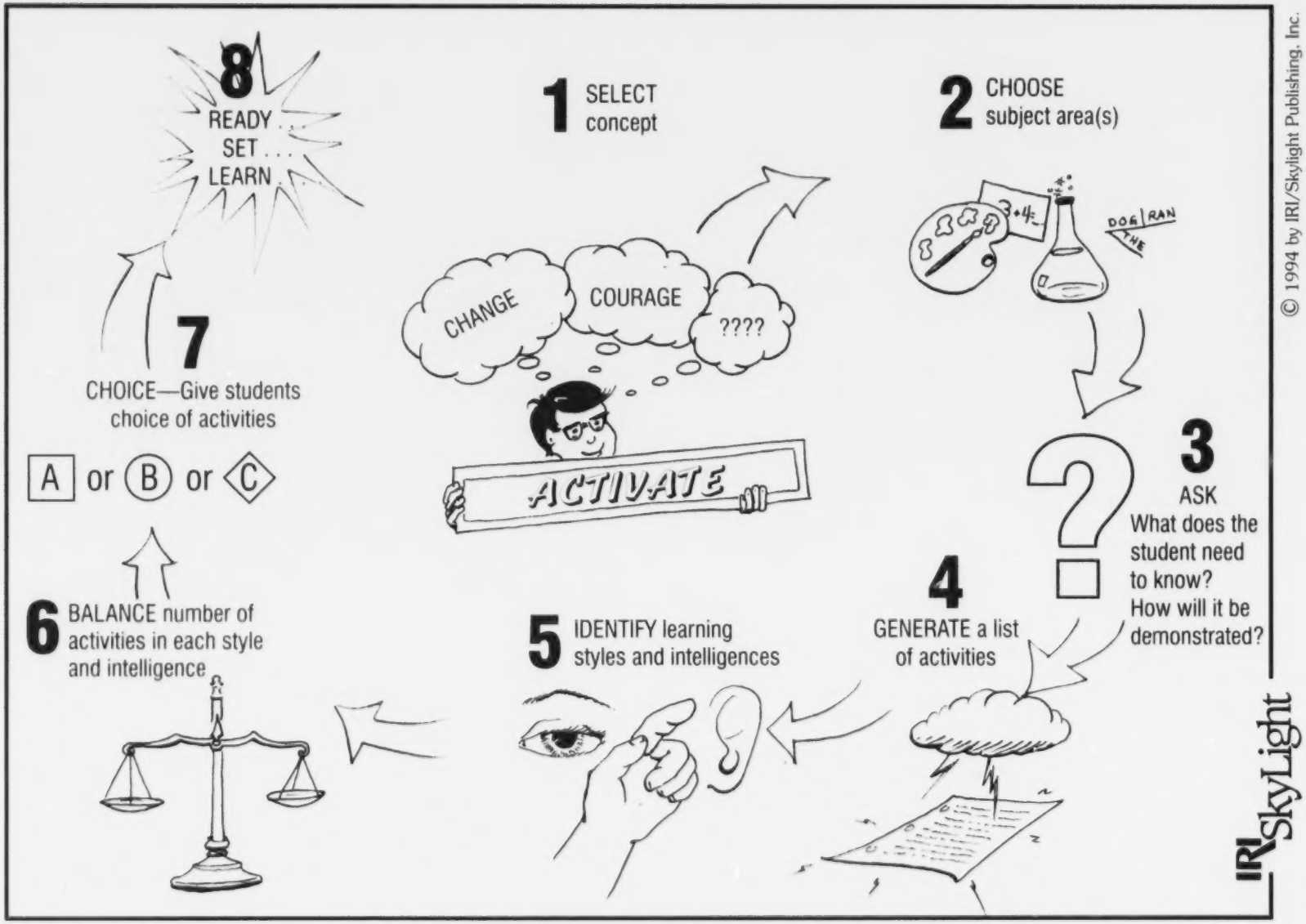

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DEMONSTRATE

Demonstrate

Assessment should be authentic,
emanating from real-world experience.

Authentic assessment provides
for active demonstrations of learning.

Portfolios are organized collections
of the students' work that exhibit
their progress, efforts, and achievements
in the learning process over time.

DEMONSTRATE

Assessment has been and always will be the foundation for measuring the effectiveness of learning goals and classroom instruction. Teachers should ask themselves the following questions when assessing activities or units of study:

- Did the activities match the instructional intention? Did the activities help students attain expected content and skills?
- Were the objectives achieved?
- Can students demonstrate their progress and capabilities as a result of instruction and involvement with the learning process?
- Most importantly, can students evaluate their own progress and achievements?

Students should be able to *demonstrate* their learning and answer the ultimate question: How will you prove to yourself and others that you've learned it?

With the advent of educational reform and societal demands for improvement, assessment must include more than simple paper-and-pencil tests. Assessment must include authentic, real-world representations of student learning. Authentic assessment offers relevance and meaning to students, accommodating individual pacing and growth. Authentic assessment emphasizes complex skills and contextualized problems, and de-emphasizes the skill of finding the single correct answer. Assessment focuses on multidimensional abilities and talents of

students, not independent attributes. The individual and the group can *demonstrate* learning as they process and hone various skills.

Research supports authentic assessment. Research tells educators that learning is not passive, but rather it is an active construction of meaning. The student's products should not be the sole emphasis; the learning process should also be emphasized. Knowledge and skills should not be merely an accumulation of isolated facts but should be integrated across the disciplines.

Although authentic assessment should be a major focus, students will also need to learn to take tests. Today's society still subjects students to a wide range of test instruments. Teachers may feel national tests are inappropriate, but students *do* need to acquire test-taking skills. These skills transfer to tasks at the university level and on the job. When students mature and enter universities or the work force, they will have to fulfill certain societal requirements imposed by various institutions. Teachers need to ensure their students' future success in these endeavors by providing a balanced approach.

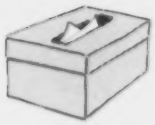
Teachers can concentrate their energies on generating possible examples of authentic assessments such as writing samples, photographs of work, poems, plays, slide shows, books, games, inventions, debates, before and after videos, songs, raps, dances, or mime.

Over time the teacher should organize and present these demonstrations through the use of portfolios. A portfolio is a collection of a student's work that exhibits to his or her peers and others the student's efforts, progress, or achievement in given areas. The student participates in selecting the content; formulating criteria for selection; making criteria for judging merit; self-reflecting; and getting involved in the self-evaluation process. As a result, a whole spectrum of real-world experiences serves as evidence of each individual's accomplishments.

Summary

Assessment is a continuously active process filtering throughout every facet of the learning process. Authentic assessment offers positive evidence of growth for students. It allows them to display their progress to teachers and parents and, most importantly, to themselves. Thus, self-judgment becomes the focus for evaluation rather than teacher appraisal. Learning becomes relevant, meaningful, and multidimensional.

Suggestions



1. If the ultimate goal of assessment is encouraging the student to learn, what can a portfolio contribute to the instructional process? Does it demonstrate student progress, learning, and problems?

2. Does a "brag box" (a box in the classroom for student comments about what they did well) need to be considered from the students' perspective? Ask the class how it helps them, and what they think about the process.

   Record your impressions of parent conferences that include students demonstrating their work.

3. When you asked students to select pieces of their work for inclusion in their portfolio, did you gain insight into individual growth patterns?

4. Would there be value in videotaping students at the beginning of the year reading a favorite story or passage, and again at the end of the year?

   Could your school benefit from making an individual video for each student? Would the videotape demonstrate the progress students make while they attend your school?

5. What insights did you gain by observing each student's demonstration? How will these insights help you improve your instruction?

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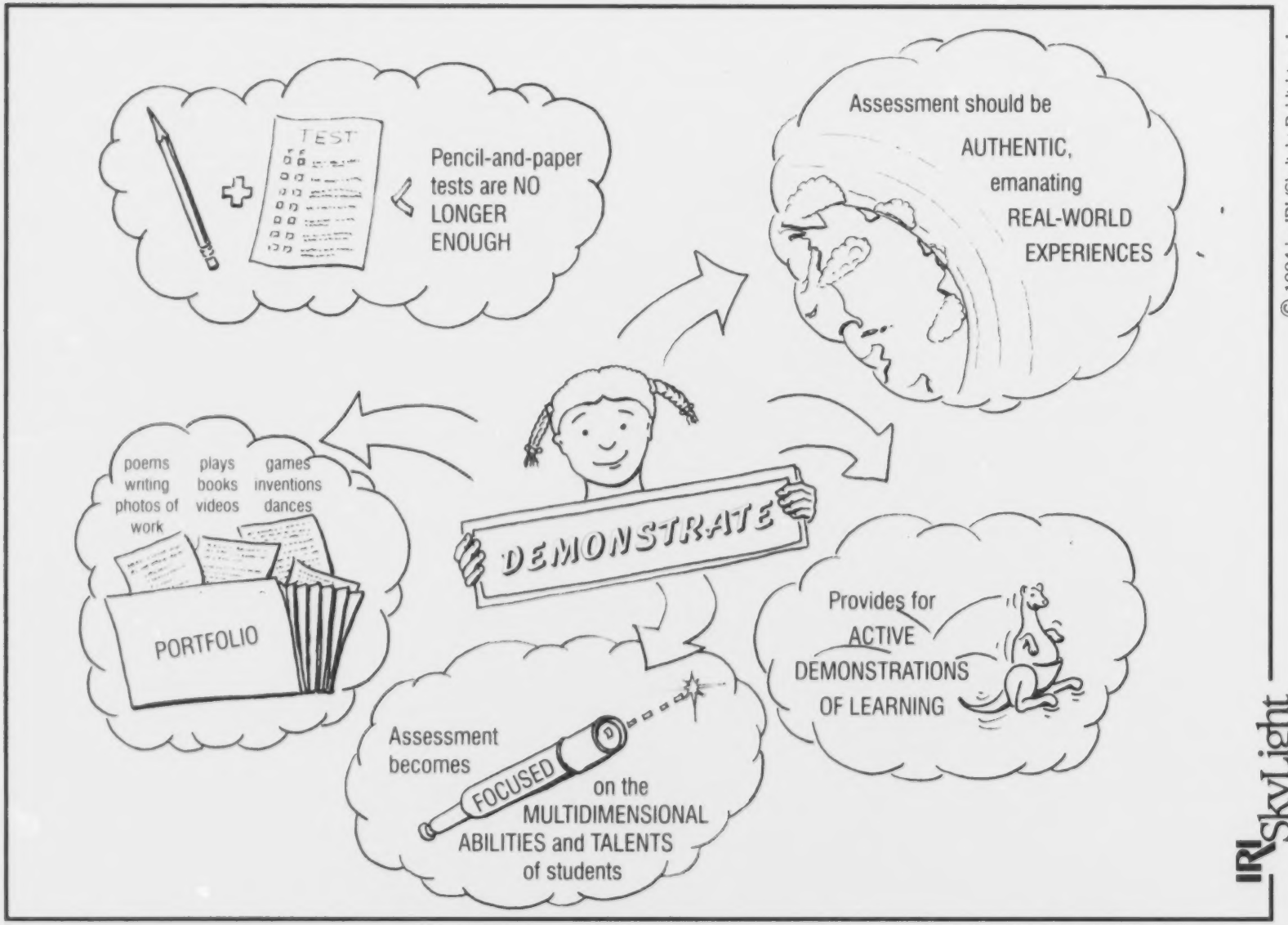
TEST
Pencil-and-paper tests are NO LONGER ENOUGH
Assessment should be AUTHENTIC, emanating REAL-WORLD EXPERIENCES
poems writing photos of work
plays books videos
games inventions dances
PORTFOLIO
DEMONSTRATE
Provides for ACTIVE DEMONSTRATIONS OF LEARNING
Assessment becomes FOCUSED on the MULTIDIMENSIONAL ABILITIES and TALENTS of students

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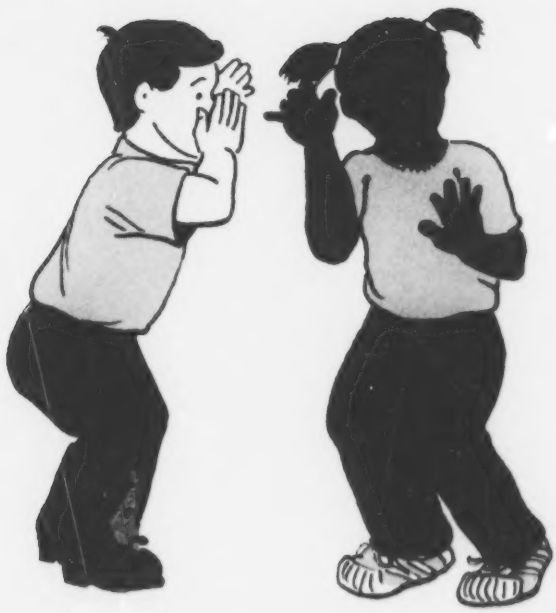


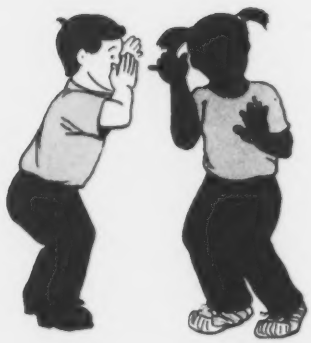
COMMUNICATE

Communicate

Communicate means "to impart, pass along, transmit; to make known."

Communicate also means "to give and receive messages in any way."

Students must be able to communicate their learning to others.



COMMUNICATE

Effective communication must involve all audiences, all participants of the process. It is the major factor in effective teaching and learning. The steps mentioned in the previous chapters—*motivate, integrate, associate, activate*, and *demonstrate*—are only effective when the *communication* process links the concepts and all persons.

Man is aided, however, by one thing that makes all communication possible and on which all communication and all culture depends; namely, that language is not a system for transferring thoughts or meaning from one brain to another, but a system for organizing information and for releasing thoughts and responses in other organisms (Hall, 1976, p. 57).

> "Effective communication involves the thorough understanding of the other person's world (listening) and conveying that understanding to that person (responding). Through accurate listening and responding, barriers that hinder mutual understandings can be broken down" (Dinkmeyer & Losoncy, 1980, p. 87).

How does communication happen and affect schools in the 1990s? Now, more than ever, communication in education is a high priority. The National Education Goals (1989), the America 2000 Plan, state and national standards, and the restructuring movement, in general, advocate better communication at all levels. Because we, the people of the 21st century, are experiencing a knowledge explosion, effective communication must be a high priority.

Communication encompasses a wide range of activities—talking, listening, hand gestures, body language, facial expression, what is said, and what is left unsaid. Cultural influences—eye contact, posture, slang, modeling, anecdotes, analogies, interactive communication, and wait time—are also forms of communication encountered daily in American schools. As in everyday life situations and businesses across the nation, communication in our schools involves all audiences as communicators.

School Communicators

School communicators include four major groups—students, school personnel, administrators, and community members.

Students communicate by valuing their learning, exhibiting self-confidence and self-esteem, writing, listening, talking, speaking, sharing, showing respect, and becoming autonomous learners. Students also communicate through skills taught and skills learned, students teaching students, displaying work, and participating in assemblies.

School personnel (teachers and support staff) communicate through classroom instruction, classroom strategies, parent involvement, staff development, and personal growth. Classroom instruction includes direct instruction, whole group instruction, and modeling. Classroom strategies include cooperative learning, small groups, questioning strategies (formulating questions that prompt interpretive thinking rather than literal thinking), and making collections of student work. Parent involvement includes making newsletters, home visits, phone calls, and sharing personal experiences. Staff development includes training in learning styles, site-based management, curriculum development, multicultural education, problem solving, and consensus building. Personal growth includes inviting experts into the classroom, talking and sharing with other teachers, peer coaching, and mentoring.

Administrators demonstrate and invite communication with staff, parents, and community members. They communicate with the staff through announcements, staff meetings, memos, message boards, handbooks, and curriculum guides. They set up parent meetings and encourage parents to become informed and involved, ask good questions, phone teachers, and volunteer in schools. They communicate with community members and help them become involved. Administrators also set up task forces, attend forums, and respond to annual reports.

Community members communicate through support for schools. Often the most neglected school audience is the community at large. In many cases, the only time local citizens are solicited to participate in the processes of schools is when a bond issue comes

up for a vote. Educators need to realize that a rapport with all ages, all members, all aspects of the community is critical if the public is to appreciate and accept reforms within the educational system. Educators must explain why the changes are being made. Community members are more likely to support school change if they understand why the change is necessary to achieve the academic goals of students.

Inter-Student Communication

It is very important for students to communicate their learning to other students. Inter-student communication promotes self-confidence and helps students *own* the knowledge they have gained. Teachers can structure the classroom and activities to enhance inter-student communication.

Teachers can provide small group and whole group instructional settings that invite inter-student communication. (See the Associate chapter for more information about grouping.) Teachers can employ cooperative learning techniques to promote student communication. Cooperative groups of two to four students promote positive interdependence, individual accountability, face-to-face interaction, and collaborative skills.

Teachers can also use questioning strategies to promote student interaction and student-teacher interaction. The teacher can encourage children to ask and answer questions while he or she acts as a moderator. Remember, research shows that children learn best when they are actively involved in the process.

Teachers can pair students to promote communication. Students can pair with peers their own grade and age, or with students having like interests.

Finally, teachers can use wait time to promote open communication. "Teachers communicate their expectations through the use of silence. When the teacher asks a question and then waits for a student's answer, it demonstrates that the teacher not only expects an answer but also has faith in the student's ability to answer, given enough time" (Costa & Lowry, 1989, p. 41).

Communication, whether verbal or nonverbal, objectifies learning. Learning becomes concrete, real, a product of good use of the mind. The student becomes actively engaged with an abstract idea or problem, focuses his or her energies to achieve a specific goal, and applies organized skills and strategies to achieve the product. The process inevitably provides insight into self and others.

Demonstrations allow students to exhibit their efforts, progress, and achievement, but the product is not the ultimate goal. The ultimate goal of demonstrations is the students' ability to experience the value of their learning firsthand. This firsthand experience comes from communicating with others.

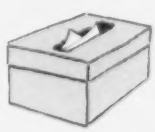
Transference from the learner to the audience, be it teachers, parents, or peers, is a catalyst and provides further motivation for students. To communicate—"to impart, pass along, transmit; to make known"—the benefits of *my* efforts to another inevitably enriches both parties. This communication unlocks the elusive door of the mind referred to in the Motivate chapter (page 1).

Communicating moves learning from the subjective, highly personal internal process of thinking to the external shared product of the students. Students move from the unknown to the known to communicating the unknown to others (this process is referred to in the Motivate chapter). The learning cycle is completed.

Summary

Communication invites students to reach out to a world rich in unknowns and ultimately to grow intellectually and emotionally. Communication allows one generation to offer the next the benefit of its own life situations. Learning becomes intertwined with a sense of accomplishment, pride, responsibility, and self-worth. Individual recognition, while important, is not sufficient. By sharing oneself with others, learning becomes a gift and responsibility, a reality.

Suggestions



1. At the conclusion of the unit you are now teaching, involve students in brainstorming ways to give away, share, show, or offer the end product to another person or group.
   - Brainstorm possible audiences (e.g., parents, other students, another class, city officials).
   - Brainstorm communication strategies (e.g., written, personal visits, demonstrations, presentations).
   - Brainstorm who will demonstrate (e.g., individual, class representative).

2. What differences in the student result from his or her communication with others? Take a moment to jot down these concrete differences.

3. How did communicating with others benefit the student? the class? parents? Did it help various audiences understand how students learn or provide insight into the goals of your class or your school?

***The next page contains a blackline. The teacher may use the blackline to demonstrate the M-I-A-A-D-C model to students or parents, or the teacher may use it as a guide in team curriculum planning or individual unit planning. The blackline serves as a prompt that particularly helps visual learners understand the concepts presented in each chapter.

Student's experience creates knowledge base
Teacher builds on previous experience of student
Student makes connections in groups
COMMUNICATE
Student demonstrates knowledge
Student communicates with others

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Part Two: Using the Elements

Sample Units

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Grades K–2

CHANGE

A Multidisciplinary Unit for Grades K–2

by

Kathy Nielson and Kathy Obersinner

Unit learning goals: Students should understand that nothing stays the same; change can be seasonal or cyclic; elements can change form; and change can vary in intensity.

Overview: We are surrounded by change. Indeed, the world in which we live is in a constant state of change. Change occurs to varying degrees and at varying speeds all around and within us. Some things change so slowly that it is only over long periods of time that we recognize that change has occurred (e.g., the movement of a glacier). Other changes occur so rapidly that we are often unable to observe them closely enough to describe what occurred (e.g., the combustion of fuel). Still other changes are fairly rapid yet easily observable (e.g., the growth of a plant or animal). Some changes are cyclic (e.g., seasonal changes) while others are linear (e.g., the passage of time or growing old). Some change is natural (e.g., erosion, growth) while other changes are brought on by human interaction with the environment (e.g., establishment of cities, hunting of animals, farming).

In education the elements of change surround us daily within such curricular topics as insect metamorphosis, the growth of plants and animals (including self), erosion, recycling, fire, and states of matter (solid, liquid, gas), to name a few. Throughout this multidisciplinary unit, the concept of change is used as the overarching theme while the curricular topics or units are integrated under the "change" umbrella. Through the use of the theme "change," students will further their knowledge of themselves and the changing world. They will observe and record change that has occured, and they will create change. Students' increased knowledge about change will result in greater understanding of changes occurring around them, increased flexibility to change, and increased ability to use change as a predictive tool.

MOTIVATE

As a whole group or in small groups, students will name all of the things they know that change. The teacher will act as a recorder of these ideas and either simply list items mentioned or record them in a web or topic format. If the web format is used, students can then generalize a title for each group. Possible groupings might include the following: changes in plants, changes in animals, environmental changes, seasonal changes, physical changes (e.g., freezing, evaporation), and chemical changes (e.g., burning, rusting).

After the group brainstorms ideas, students will individually search at home or outside the school room for an item that shows evidence of change. Groups can make suggestions to individuals who need help.

INTEGRATE

Throughout this unit, each activity integrates two or more of the following curricular areas: math, science, language arts, social studies, art, or music. In addition, activities have been selected to address each of the seven intelligences as described by Howard Gardner in his book *Frames of Mind* (1983). This integration of curricular areas and intelligences will be apparent in the detailed activities as listed in the Activate section of the unit.

ASSOCIATE

Grouping patterns for children are based on the activity at hand and vary throughout the unit. Many activities listed can be conducted with either the whole group, small group, or individual students. Some activities, however, are best suited to one grouping pattern. The teacher must select the grouping pattern best suited to the activity as well as to the group of

students or to the individual student, keeping in mind that a balance of grouping patterns is needed. Grouping patterns used throughout this unit are flexible and dependent upon the needs of the students.

Generated Activities

ACTIVATE

☐ If You Could Change Your Name

Materials: paper, markers, paint, crayons, book of names

Procedure:

- Read from a book of names and talk about what names mean.
- Discuss how children might feel if they had other names.
- Students can try out different names or change names for a day in the classroom.
- Talk about names of favorite characters in a book—what if their names were different? Would this change who they were?
- Students illustrate names:
  - On paper that is folded in half, write name in cursive (if possible) along fold. Cut out and open up, and color as desired.
  - Write name in bubble letters.
  - Use paint, glitter, crayons, etc. to decorate and fill in the letters.
  - Make name huge, small.
  - Tell what your name means, illustrate.
  - Display names.

Assessment: Each child will say what his or her name means and illustrate it.

☐ "I used to be _____ but now I'm _____."

Materials: paper

Procedure:

- Write on board "I used to be _____ but now I'm _____."
- Ask children for examples.
- Children make up their own on paper.

Assessment: Each child will write at least four lines of the above, indicating a change from something he or she used to do or be.

☐ Interview

Materials: paper, markers, paint

Procedure:

- Students interview their parents or grandparents about their favorite games, singers, pastimes, etc. when they were young.
- Students interview friends about above.
- Students make display, advertisements, bulletin boards, chart, etc. to demonstrate what they found out and to compare the past with the present.

Assessment: Children will interview their parents or grandparents and friends about favorite games, singers, dances, TV shows, etc., then make visual representations of their findings.

☐ Grandfather Tang's Story

Materials: tangrams, *Grandfather Tang's Story* (Tompert, 1990)

Procedure:

- Read *Grandfather Tang's Story*.
- Have the children use tangrams to make the various animals in the story or ones of their own invention. They may write their own stories and illustrate them by tracing around their constructions.

Assessment: Children will experiment with tangrams, making shapes and tracing around them to create their own animals or creatures.

☐ Ten Black Dots

Materials: Ten Black Dots (Crews, 1986); paper unlined on top, lined on bottom; 3/4" black adhesive dots

Procedure:

- Read *Ten Black Dots*.
- Ask the children for their ideas about what to do with one, two, three, or up to ten black dots, listing them on chart paper.
- Suggest they make their own "Ten Black Dots" books.
- Have paper and dots set out for children to use over next few days.
- Once children have made their books, ask them if they know how many dots they each used. Suggest working with a partner to figure it out.

- Write on board: "I used _____ dots. I got my answer by _____." Children attempt to solve the problem, writing their explanations on paper.
- Have children share how they got their answers with the class.
- If desired, try to figure out how many dots the whole class used.

Assessment: Each child will make their own "Ten Black Dots" book using appropriate numbers on each page, and will work with a partner to figure out how many dots they used, writing down their solution.

☐ Apple Sculpture

Materials: firm apples, paring knife, lemon juice, pipe cleaners or wire, salt, shellac, cloves for eyes, cotton, scraps of fabric or yarn

Procedure:

- Each student peels an apple, cuts out the core, and stuffs the center with cotton.
- Students carve features into their apples, but not too deeply.
- Students dip their apples in lemon juice and cover them with salt. This keeps the apples from shrinking too much.
- Students weigh and measure their apples. They can let the apples dry in a warm place for about four weeks (or dry them in an oven for five hours at 100 degrees, then at room temperature for one week). Have each student keep a journal about the drying process, weighing and measuring the apple every week.
- After the drying process, students wash and dry the apple.
- Students cover their apples with shellac and add any decorations they wish.
- Students can use the apple as the head for a puppet or doll, add clothes, hair, etc.

Assessment: Children will keep journals recording the changes in their apple over the four weeks.

☐ Explorations with Four Toothpicks

DAY ONE

Materials: toothpicks; white glue; shallow cups for the glue; different colored construction paper for each group (cut into 6" x 9" pieces), 24 pieces of each color

Procedure:

- Challenge the children to find as many different ways as they can to arrange four toothpicks following two rules: each toothpick must touch the end of at least one other toothpick, toothpicks must be placed end-to-end or be placed so that they make square corners. (There are 16 different ways to arrange the toothpicks.)
- Ask for examples. Demonstrate how a shape turned upside down or to the left is still the same shape.
- Check a shape by drawing it, holding it up to the window, and flipping it around.

DAY TWO

Materials: recording sheets divided into 16 rectangles, with a different 3 x 4 array of dots in each rectangle (have one recording sheet for each small group of students); 5" x 8" index cards

Procedure:

- Demonstrate how to draw each pattern found in the rectangles on the recording sheet.
- Tell students they are going to make a deck of cards with these patterns. Tell them to cut an index card into four parts; cut the dot paper apart; and glue each pattern to one of the quarters of the index card. Have students decorate the back of cards the same, so they can identify them as their group's deck. Then they should put a rubber band around the cards and put them in a basket.
- Have one group post their dot patterns so others can compare and be sure they have all possible patterns.
- Teacher should check all decks to be sure they include all 16 patterns, making notes on those that don't so students can check their work the next day.

DAY THREE

Materials: large chart, four toothpicks for each group

Procedure:

- Number the posted pattern card set and ask the children to put their dot pattern cards in the same order and number them the same to identify identical cards easily.
- Pose the "put in order" problem. Have the groups choose any

card and make that pattern with the toothpicks. Ask the groups to arrange their cards in a line so that each pattern could be changed to the next one by moving just one toothpick. Model.

- Ask children to record the order of their cards on a large chart so that the class can look for patterns in their solutions.
- Discuss the different patterns and how children got them.

DAY FOUR

Materials: decks of cards, four toothpicks for each group

Procedure:

- Teach children how to play a card game with their patterns.
- For groups of four, choose any card and make that pattern with the toothpicks. Shuffle that card back into the pack and deal all cards so each player has four. Model with a group.

  For groups of three, don't shuffle the beginning card back into the deck. Instead, leave it face up on the table. Then deal the remaining cards. Ask how many cards they would each get (five).
- To play, students place their cards face up in front of them so all cards are visible. Each student's goal is to get rid of all of his or her cards. Students take turns. On each turn, the student may discard one card, as long as the pattern on that card can be made by changing the position of just one toothpick in the pattern that is lying on the table. Model. If the student can't play, he or she says "pass." Whoever goes out first scores a point, but the group continues playing. If the group reaches a stalemate, they need to decide, as a group, what to do.

Assessment: Each child will demonstrate how to make different patterns by arranging the toothpicks. Each child will also demonstrate how the patterns are related to one another by making a set of pattern cards and successfully playing the card game.

In addition to the assessments that are listed for each activity in the Activate section, students will:

DEMONSTRATE

- Create a display that includes a timeline of his or her life; photos of growing up; data including weight, height, etc. from birth to present; and any other information the child desires to include.
- Compile a "change" folder that includes stories, poems, music, interviews, etc. completed during the course of the unit.

- Create a display of invented islands or cities along with the fictional writing students created.
- Display any other products created during the course of the unit in an aesthetically pleasing manner.

COMMUNICATE

Students will participate in an open house "changes" fair to which peers, friends, and family will be invited. Children will describe their products, as listed above in the Demonstrate section, to those attending the fair with emphasis on their understanding of the concept of change and how each product depicts change.

Grades 3–5

THE HORSE COURSE

by

Pamela J. Hall

This unit is written for grades three, four, and five and integrates language arts, math, science, social studies, and art. The central focus is to increase students' awareness of how domestic animals contribute to our lives and our culture.

Overall Goals

- To familiarize students with the horse and how it has adapted to its environment throughout history
- To acquaint students with the responsibilities of owning and caring for a horse
- To expose students to the various ways horses have been used and are used in the workplace, in competitions, and in recreational activities
- To develop students' appreciation for the horse and its relationship to humans

SECTION I

Horses in History

MOTIVATE

Students will examine Breyer models of horses in various colors. Books such as *Sixty Million Years of Horses* (Darling, 1970), *Horses of Long Ago* (Ipcar, 1965), *Horses: How They Came to Be* (May, 1968), and *The Horses the Indians Rode* (Lavine, 1974) can be offered for students to skim and to study illustrations. Students will be asked to formulate responses to the following scenarios:

- Pretend you are a caveman who struggles daily to survive. While hunting, you cross a grassy plain and discover a herd of four-legged, hair-covered animals about as tall at the back as your waist. What would you do?
- You are the king's most respected person of ideas. He looks to you for solutions to some of his major problems. The kingdom has used horses to pull wagons for the foot soldiers for years, but it seems that the foot soldiers just aren't as effective in battle as they could be. They need to approach enemies faster. Do you have any ideas?
- You are an Indian boy or girl and are suspicious of the strange white men who have invaded your settlement. They ride magnificent creatures called horses and do not suffer any misfortunes, yet they tell your people over and over that to touch such "gods" will strike you dead! What can you do to solve this mystery?

Discuss with students their reactions to the models, books, and questions. They should understand that horses did not always look like today's familiar animals and that various groups of people used and learned about horses according to needs they had.

INTEGRATE

This unit, while specifically focusing on horses, is adaptable and useful as a guideline for units on other domestic animals, such as dogs. It is an integrated unit of study under the theme of adaptation, and it includes content from the areas of science, math, language arts, social studies, art, mythology, and nutrition. The topic of horses is replete with sophisticated and specialized terminology and offers many opportunities for further independent study and is thus suited to gifted and talented learners as well as *all* other students interested in horses.

Sample Units

After participating in the activities offered throughout this unit, students will surely gain an appreciation for the magnificent horse and the integral part it has played and will play in human lives.

ASSOCIATE

Students will complete activities individually, in pairs, in small groups, or as an entire class as appropriate for given situations and times. When possible, students should choose the ways they prefer to learn the information.

ACTIVATE

Objectives: to learn the stages of evolution of the horse and the geographical locations of its existence; to examine early man's relationship to horses through various cultures' use and care of horses; to investigate the depictions of horses in various cultures' art, mythology, superstitions, and religious practices.

Generated Activities

- ☐ By examining depictions of evolutionary changes in horses taken from charts in books such as *Horses: How They Came to Be* (May, 1968), *Horses of Long Ago* (Ipcar, 1965), and *The Morgan Horse Activity Book* (Eidam, 1990), students will learn the major stages of change the horse underwent over millions of years to become the horse we are familiar with today. Students will measure and post on a wall the different heights of evolving horses.
- ☐ Students will play a true-false trivia card game consisting of information about various cultures' use of horses. (An excellent source is *Horses of Long Ago* [Ipcar, 1965]). Tidbits will cover items such as the following:
  - The Arabian is the oldest foundation breed.
  - Sythians were the most expert horsemen of ancient times.
  - Only the rich Greeks owned horses.
  - The first iron horseshoes were made by the Romans.
  - Saddles with stirrups were invented by the Chinese.
- ☐ Students will investigate Alexander the Great and his famous steed Bucephalus by reading *The Secret of Alexander's Horse* (Palazzo, 1965).

- ☐ Students will gather and share information pertaining to horses in art by visiting the library.
- ☐ Students will uncover the stories about night*mares*, lucky horseshoes, horsetail hairs turning into snakes, and other superstitions by perusing folklore books.
- ☐ Students will compare the role of horses in mythology such as Pegasus, the winged horse of Greek mythology, and Sleipnir, the eight-legged horse of Norse mythology who could travel on land or sea.
- ☐ Students will create artwork to accompany important content from lessons about various cultures. For example, Japanese horse masks, Greek chariots, Spanish mosaics, caveman sculpts, or Indian murals could be created.
- ☐ Students will attend a field trip to a nearby zoo to participate in a program about wild horses and zebras.

DEMONSTRATE

Students will demonstrate their understanding of the historical highlights relevant to horses by creating a time line of significant evolutionary and cultural events.

COMMUNICATE

Time lines will be displayed throughout the school. Lower grade-level students can be invited to come examine the work and to ask students questions about their individual time lines.

SECTION II

Owning and Caring for a Horse

MOTIVATE

A real horse can be brought in for students to examine. They will pet, brush, and feed the horse hay and grain. They will be shown its teeth and hooves and will be asked to look closely at the size of its eyes, legs, head, etc. Students will be asked to speculate about the following:

- How much do you think this horse weighs?
- How much do you think this horse eats and drinks each day?
- Why do you think the horse's tail is important?

- Why do you suppose this horse is wearing horseshoes?
- The horse has eyes on the sides of its head. What do you imagine it can see?
- Why do you think the horse has such large nostrils?
- What's happening with the horse's ears?
- What information do you think we can gather by looking at the horse's teeth?

(You may add your own questions.)

INTEGRATE

This unit, while specifically focusing on horses, is adaptable and useful as a guideline for units on other domestic animals. It includes content from the areas of science, math, language arts, social studies, art, mythology, and nutrition. The topic of horses is replete with sophisticated and specialized terminology and offers many opportunities for further independent study.

ASSOCIATE

Students will complete activities individually, in pairs, in small groups, or as an entire class as appropriate for given situations and times. When possible, students should choose the ways they prefer to learn the information.

ACTIVATE

Objectives: to learn basic terminology relative to horses and horse care; to learn fundamental horse care; to distinguish common breeds and colors of horses; to recognize general horse behavior.

Generated Activities

- ☐ Students will construct word mobiles or dictionaries consisting of terms relative to horses and horse care. Sales papers and catalogs of equine supplies and reference books will be used to help students explain word meanings.
- ☐ Students will examine anatomy booklets during a visit with a real horse. (See page 66 for information on where to obtain booklets.)
- ☐ A guest speaker, an equine veterinarian, will be invited to talk with the students about horses, horse care, and some common illnesses suffered by horses.

- ☐ Students will take a field trip to a nearby feed store such as a farmer's cooperative or a tack and saddle store. Students will be asked to calculate costs of feed and tack. Students will be supplied with a shopping list and will be instructed to be comparative shoppers. Prices will be recorded and totaled. A debriefing session will follow upon returning to class.
- ☐ Students will learn the importance of proper diet for a horse by examining charts depicting horses' approximate weight, age, and work performed. A comparison to humans will be made. Students will prepare and consume horse snacks such as carrot sticks, apples, and oatmeal cookies.
- ☐ Students will examine promotional materials provided by various breed registries or associations. They will be encouraged to write a letter to the breed association of their choice to request materials of their own. Students will choose a favorite breed and will investigate additional information by visiting a library or using class reference books.
- ☐ Students will learn colors and common markings of horses by matching description cards to appropriate photographs, posters, and magazine pictures of horses.
- ☐ Students will participate in thinking skills lessons on the following:
  - Classifying care products according to things that belong in a feed room, a tack room, a grooming and veterinary supply room, or a horse's stall
  - Comparing and contrasting English and western riding equipment
  - Indentifying reliable sources to consider when buying a horse
- ☐ Students will read excerpts from *Horsewatching* (Morris, 1989), *The Real Book about Horses* (Sherman, 1952), and *The Horseman's Bible* (Coggins, 1966) pertaining to a horse's body language and behavior. Students will be asked to compare the horses' body language and expression of emotions to that of humans. Students will role play some herd behavior.

DEMONSTRATE

Students will demonstrate an understanding of caring for and owning a horse by creating a schedule of care for a fictitious equine friend. Students will choose a favorite breed, color, and gender for the horse and will include an explanation as to why the particular characteristics were picked. Safety tips related to handling the horse will be included as well as a time frame for what and when the horse eats, is groomed, is exercised, etc. Students must include provisions for regular horse shoeing, vet visits, etc.

COMMUNICATE

Students will invite a parent or guardian to accompany the class on a field trip to a riding stable. As a condition for attendance, the student must teach the parent or guardian how to behave around horses. They must also explain any information about the tack to be used and must point out the specific color and any prominent markings of the assigned stable horses.

(Note: The trip might necessarily be made over several visits to accommodate a large group. Stables often have instructional presentations, group rates, and flexible operating hours.)

SECTION III

Horses in Work, Competition, and Recreational Activities

MOTIVATE

Students will be asked to differentiate among working, competing, and doing something for fun. They will be asked to pair up with a friend and to make a chart with these categories: "horses at work," "horses in competitions," and "horses at play." Given approximately five minutes, students will brainstorm lists of items for each category. Later, answers will be shared with the entire class.

Students might have some overlapping answers, but help them to look at answers from different perspectives. For example, participating in a horse show is both competitive and recreational for amateurs. However, for serious participants wishing to earn money, performing in a rodeo could be work and competition.

INTEGRATE

This unit, while specifically focusing on horses, is adaptable and useful as a guideline for units on other domestic animals. It includes content from the areas of science, math, language arts, social studies, art, mythology, and nutrition. The topic of horses is replete with sophisticated and specialized terminology and offers many opportunities for further independent study.

Students will complete activities individually, in pairs, in small groups, or as an entire class as appropriate for given situations and times. When possible, students should choose the ways they prefer to learn the information.

Objectives: to investigate past and present occupations involving horses; to explore competitive endeavors requiring horses; to recognize pleasurable activities associated with horses.

Generated Activities

- ☐ Students will interview a mounted police officer guest speaker concerning his job and responsibilities as they relate to his use of a horse.
- ☐ Students will take a field trip to an institution or farm with a therapeutic program designed to accommodate the mentally and physically challenged through contact with horses.
- ☐ Students will visit a farm that raises a specific breed of horse.
- ☐ Students will investigate horses used in the past as fire horses, coal mine workers, stagecoach pullers, pony express transportation, and movie stars in black and white films by conducting research in the library. If possible, invite an elderly guest to discuss with the students memories of delivery horses in the city, horses working on the farm, or other horses used for work.
- ☐ Students will watch videotapes of competitions that interest them. Competitions may include a polo match; a rodeo segment depicting bareback riding, barrel racing, or roping; Olympic equestrian events; thoroughbred races; pacing or trotting races; or steeplechasing.
- ☐ Students will learn how fast horses run in specific competitions and will compare those speeds to human athletes. Students will compare furlong measurements to feet, yards, and miles.
- ☐ Students will investigate the origins of fox hunting in England and will learn an old English hunting song or a poem related to the hunt.
- ☐ Students will read *Island of Wild Horses* (Scott, 1978) to learn about Pony Penning Day on Chincoteague Island.
- ☐ Students will call or write to the state Department of Parks and Tourism in order to acquire information pertaining to horse

vacations or trail networks for pleasure riding in the state.

- ☐ Students will learn about the importance of position in oval-track races by having a "horse race" of their own. Divide students into groups of six or eight and allow them to run footraces. Afterward discuss how the person closest to the inside boundary has the advantage and find out any particular strategies the runners might have employed to get ahead.

DEMONSTRATE

Students will demonstrate their understanding of horses at work, in competition, and as a part of recreational activities by creating a "fold-a-test." Instructions to students are:

1. Divide your paper into three sections (use the front side only): horses at work, horses in competition, and horses at play.
2. Use crayons, markers, or colored pencils for your drawings. Each section of the test must contain a drawing to represent the section title.
3. Write a brief explanation of what you know about the specific section.

COMMUNICATE

Students will write rap songs, lyrical songs, poems, short stories, advertisements, etc. about horses at work, in competition, and in recreational activities. Illustrations will accompany the written pieces. Students will festively share their creations by hosting a writer's round table gathering for parents or for other students in another grade or school. Refreshments will be served.

Horse anatomy booklets are available from:

American Quarter Horse Association
P.O. Box 200
Amarillo, TX 79168

American Horse Publication
c/o National Horse Center
4059 Iron Works Pike
Lexington, KY 40511

Appaloosa Horse Club
P.O. Box 8403
Moscow, ID 83843

North America Riding for the Handicapped Association
P.O. Box 33150
Denver, CO 80233

United States Pony Club
893 South Matlock Street, #10
West Chester, PA 19382

Grades 5–7

MICHELANGELO IS NOT A TURTLE

by

Judith Bynum

This unit is a skeletal framework of cultural areas not normally introduced in the regular curriculum. From the fancy, ornate, Baroque world of Handel and Bach to the dreamy, Impressionistic world of Monet, from the brassy, exciting world of the jitterbug to the ancient tales of the Greek gods, all sorts of sounds, styles, stories, and quotes will be experienced during this study.

SECTION I

Music

MOTIVATE

Students will brainstorm all the composers they know. Teachers will then write categories of musical periods on the board and ask students to categorize composers. Since most of their offerings will come from the Modern Period, students will readily realize their lack of knowledge of the earlier eras.

INTEGRATE

This section integrates these subjects—music, art, history, English, and science—and these intelligences—verbal/linguistic, visual/spatial, bodily/kinesthetic, and intrapersonal.

ASSOCIATE

Small group activities include discussion and making a time line. Whole group activities include listening to tapes and stories and doing artwork. Independent activities include research on the harpsichord, historical persons, and events.

ACTIVATE

Generated Activities

Baroque Period Overview

- ☐ Students will make a time line of famous persons in history interspersing historical events, such as the Black Plague, *Oberammergau Passion Play*, etc.
- ☐ Students will report individually on these events and persons to the class.

Baroque Period: Bach

- ☐ Students will view the first part of the *Fantasia* videotape (Walt Disney Productions, 1991) that includes the performance of the Toccata and Fugue in D Minor. Students will then draw scary pictures to illustrate what they heard.
- ☐ Students will listen to an overview of the life of Johann S. Bach and a cassette of a story of Bach (Kennedy, 1983).
- ☐ Students will visit a local church with a pipe organ to hear how it sounds.

Sample Units

Baroque Period: Handel

- ☐ The class will listen to a tape of Handel's "Hallelujah Chorus" from the *Messiah* and the same from *Handel's "Young Messiah"* (Mills, Hart, Joseph, & Miller, 1990). Students will compare and discuss which version they preferred.
- ☐ While students listen to the Royal Fireworks Music overture, they will create their own dazzling fireworks pictures with crayon relief.
- ☐ Students will listen to the story of Handel's life (Kennedy, 1983).

Classical Period Overview

- ☐ The class will compare the neat, orderly, Classical era to the fancy, splendid, ornate, Baroque era with pictures of dress and selections of music.
- ☐ Students will learn new vocabulary by creating paragraphs that include the words *opera*, *oratorio*, *fugue*, and *toccata*.

Classical Period: Haydn

- ☐ Students will listen to the Surprise Symphony (Symphony 94 in G).
- ☐ Students will learn a jingle as a device for remembering a tune.
- ☐ Students will listen to a selection played on a keyboard, using the harpsichord setting. This allows students to hear its unique sound.
- ☐ Students will research to discover why harpsichord sound is different from that of a piano.
- ☐ Since Haydn was the father of the symphony, students should become familiar with a symphony. First, students will become acquainted with the orchestra and its instruments through listening to *The Musical Life of Gustav Mole* (Twinn, 1989). Then students will learn simple rules of etiquette for attending a performance. Finally, students will attend a symphony.

Classical Period: Mozart

- ☐ The class will discuss the definition of "prodigy" and watch excerpts of *Amadeus* (Hausman & Ohlsson, 1984).
- ☐ The class will plan and hold a "Wig Out with Wolfgang" party. Students will create a white wig to be worn at the party. Students can play games, such as "Pin the Wig on Mozart" and Mozart Trivia, and create original games at the party.

☐ Students will learn new vocabulary words while music is being softly played. Vocabulary words could include: *minuet, sonata, symphony, brass, string, woodwind, percussion, orchestra, harpsichord, prodigy, mass.*

Note: These are but a few of the activities that could be used, since the unit covers all the eras of music.

DEMONSTRATE

- Students will individually select a composer of the Romantic era to introduce to the class. The presentation will include historical background, a sample of the composer's music, and a fun activity.
- The class will play "Name That Tune" for fun and small prizes to check retention of classical pieces that they have studied.
- Students will participate in a musical scavenger hunt of what they learned during the entire study of music. Students should listen for classical pieces they have learned on television, radio, movies, and CDs. Students will make lists of media that use classical music as a soundtrack.

COMMUNICATE

Students will share their projects with other classes, especially younger grades.

SECTION II

Art

MOTIVATE

Each day, the teacher displays a famous masterpiece. Students must try to identify the masterpiece by the following day by asking others and doing research.

INTEGRATE

This section integrates these subjects—art, math, science, and history—and these intelligences—bodily/kinesthetic, visual/spatial, intrapersonal, and verbal/linguistic.

Sample Units

ASSOCIATE

Small group activities include artwork at tables and discussion. Whole group activities include viewing videos, listening to stories of artists, and discussing and planning an art show.

Generated Activities

Van Gogh

ACTIVATE

- ☐ Students will view a bulletin board displaying some of Van Gogh's paintings.
- ☐ Students will finger-paint a textured painting of a starry night.
- ☐ Students will view a video on Van Gogh's life. (Videos can be found at a local library or video store.)
- ☐ To stress intensity of color, students will color outlined pictures of Van Gogh's *Sunflowers*.

da Vinci

- ☐ *Mona Lisa* will be displayed for students to see while coloring their own "Mona Lisa." Students will try to shade their drawings with various shades of greens, blues, and browns.
- ☐ Students will listen to *Mona Lisa* by Nat King Cole.
- ☐ Students will study *The Last Supper* and will research its miraculous survival during World War II.
- ☐ Students will also study da Vinci as an inventor and a scientist.

Michelangelo

- ☐ Students will attach paper to the underside of a table. Then they will lie under the table and paint on the paper. This will help them understand that painting the Sistine Chapel was an amazing feat.
- ☐ Students will watch *The Agony and the Ecstasy* (Reed & Dunne, 1988).

Picasso

- ☐ Students will look at the painting, *The Three Musicians*, discovering that it looks like a collage.
- ☐ Students will try their hand at drawing and coloring the painting, noting the geometric shapes and lines included.

Monet

- ☐ Students will paint a landscape using tempera on Q-Tips to give a speckled effect.

- ☐ Students will be introduced to pen-and-ink, oil painting, and watercolor, and will try using these mediums.

Note: These are only a few of the activities that may be used in this unit.

DEMONSTRATE

Students will have an art show of famous paintings, including samples of their own painting and artwork.

COMMUNICATE

Students will serve as docents for the art show.

SECTION III

Dance

MOTIVATE

Students will list ten animals on their paper. They should match a dance of today with the animal's character.

INTEGRATE

This section integrates these subjects—music, drama, and history—and these multiple intelligences—visual/spatial, bodily/kinesthetic, musical/rhythmic, and verbal/linguistic.

ASSOCIATE

Small group activities include demonstrations of eras. Whole group activities include listening to guest speakers, learning to dance, and discussing. Independent activities include researching dances.

Generated Activities

Ballet

ACTIVATE

- ☐ You may invite a dance instructor to introduce the elements of ballet, as well as teach the class basic ballet positions.
- ☐ Students will research the history of ballet and the reasons it is still a viable art form.

Sample Units

- ☐ Students will watch a video of a live ballet presentation.
- ☐ Students will discuss why ballet is used extensively in pro-football training.

Tap

- ☐ You may invite a dance instructor to introduce the elements of tap dance and teach the class an easy routine.
- ☐ Students will watch a video of a famous tap dancer, such as Jimmy Cagney.
- ☐ Students will attend a tap dance recital as a group.

Ballroom dancing

- ☐ You may invite a dance couple to introduce students to various ballroom dances.
- ☐ Students will listen to samples of music and identify them according to types of dance.
- ☐ Students will watch a video of a ballroom dancing team, such as Fred Astaire and Ginger Rogers.
- ☐ Students will discuss the beauty of ballroom dancing and compare how it differs from modern dancing.
- ☐ Students will learn basic steps to the waltz.

Modern dance

- ☐ Students will discuss the various eras of dance of this century, such as the Charleston, the Twist, and Walking the Dog.
- ☐ Students will listen to excerpts of music from each decade of this century.
- ☐ To better understand how music and dance mirrored the national feeling of the time, students will make an historic/music/dance time line.
- ☐ Students will match modern dances with animals who move similarly.

DEMONSTRATE

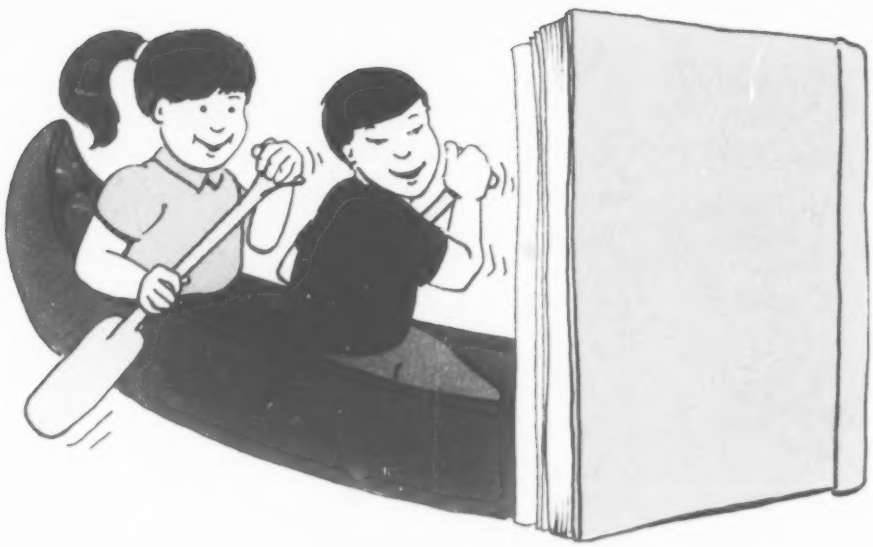
Students will be divided into groups. Each group draws a slip of paper to tell them which historical era they represent. Eras might include: Prehistoric, Dark Ages, Renaissance, Victorian, World War II, and post-World War II. The groups will write scenarios of dance during that era and will present them to the class.

COMMUNICATE

Students will create a video of class speakers, students' activities, and portions of old videos that show dancing. This video will be used in other classes as a reference.

Note: This unit could also include a section about literature, famous inventors, explorers, scientists, and philosophers, and an overview of basic etiquette rules of today.

Grades 6–8



VOYAGES INTO LEARNING

by

Judith Bynum

Ahoy, mate! We are embarking on voyages on ships, both real and imaginary, for an in-depth look at the highways of the seas and their influence on our lives. All subjects and intelligences will be integrated into the activities.

Welcome aboard!

SECTION 1

Voyages of Exploration

MOTIVATE

Set up room displays of maps, posters of famous explorers, and globes. Use the National Endowment of Humanities exhibit, *Seeds of Change* (Viola & Margolis, 1991), for information about Columbus' influence on our world. The whole class can play the Explorer's Card Game (Clarie, 1989) for a pretest.

INTEGRATE

All subjects and intelligences will be integrated into the activities.

ASSOCIATE

Small group activities include games, discussions, cooperative learning, map work, and jingles. Whole group activities include watching videos, listening to tapes, holding debates, and creating artwork. Independent activities include research on an explorer and a "create-a-land" project.

ACTIVATE

Generated Activities

- ☐ Student groups will create jingles as mnemonic devices to remember explorers and historical data.
- ☐ Students will watch a video about Columbus' voyage.
- ☐ Students will study plants, animals, and foods explorers brought to the New World and their effect on the world as a whole.
  - *The horse.* Students will write stories of the Wild West or pioneers *without* horses.
  - *Cotton.* Students will make cotton ball wreaths, tour a cotton gin or a museum of agriculture, and pick cotton.
  - *Sugar cane.* Students will debate whether this crop caused the enslavement of blacks in the New World and the eradication of Indians on some Caribbean Islands. Students will taste sugar cane.
- ☐ Students will write a play on Columbus' life.
- ☐ Students will design and build "create-a-land." Students will create their own "land"—its culture, inhabitants, location, foods, government—and present it to the class.

- ☐ Students will consider the Native Americans' or the early sailors' attitudes about exploration.
- ☐ Students will choose present or future topics to research and explore.

DEMONSTRATE

Students will explain their create-a-land projects orally and be videotaped while giving oral reports on explorers. Students will use the Explorer's Card Game (Clarie, 1989) as a post-test or in a quiz bowl format. Students will create and share jingles or songs with other classes.

COMMUNICATE

Students will display create-a-land projects at a parent-teacher conference and will serve as docents for community visitors viewing the *Seeds of Change* exhibit (Viola & Margolis, 1991).

SECTION II

Voyages of Scientific Research

MOTIVATE

Display marine animal posters, shell collections, and a door decoration of an open whale's mouth, and show the *Voyage of the Mimi I* (Driggs, 1985) video curriculum. Students will brainstorm purposes of scientific oceanic research to check their knowledge level of ocean animals.

INTEGRATE

All subjects and intelligences will be integrated into the activities.

ASSOCIATE

Small group activities include experiments, discussions, construction of model ships, and the study of sign language through cooperative learning. Whole group activities include going on field trips, listening to stories and tapes, hearing guest speakers, doing simulations, watching videos, and creating art projects. Independent activities include doing research on whaling, journal writing, role playing, and acting as an "expert for a day."

Generated Activities

ACTIVATE

- ☐ Students will complete science and math experiments involving water pressure.
- ☐ Students will take a field trip to a scuba shop.
- ☐ Students will participate in "Shipwrecked" critical thinking simulation (Hannemann & Potter, 1993).
- ☐ Students will write a ship's log of research findings.
- ☐ Students will create an "oil spill" model to study the effects on the ocean and its inhabitants.
- ☐ Students will read *The Whale's Song* (Sheldon, 1991) and create watercolor silhouettes of whales in the sunset.
- ☐ Students will do research about whales.
- ☐ Students will listen to excerpts of *Moby Dick* (Melville, 1851/1981).
- ☐ Students will learn sign language as it is used by divers.

  (Extension: Teacher may launch into a study of deaf persons, including Helen Keller, if time permits.)
- ☐ Students will take a field trip to an aquarium, marine museum, or research lab.
- ☐ Students will study endangered oceanic species.
- ☐ Students will listen to guest speakers on scientific research methods and oceanography.
- ☐ Students will learn the scientific method of study.
- ☐ Students will create shell frames.
- ☐ Students will create tropical fish from colored paper for blue plastic-wrapped bulletin board.
- ☐ Students will learn sailing songs from the past and the present.
- ☐ Each student will become an "expert for a day" to show that every person has a gift to share.

DEMONSTRATE

Students will give "expert for a day" presentations; illustrate the use of sign language with deaf students; give oral presentations; and develop experiments using the using the scientific method for a school science fair.

COMMUNICATE

Students will teach primary classes about marine mammals using games and songs; write letters of support to environmental groups for preservation of whales; and create and record public service messages about recycling for local radio broadcasts.

SECTION III

Voyages for Defense

MOTIVATE

Invite a Navy recruiter as a guest speaker to explain today's ocean defense system. Students will brainstorm problems of defense in history, in the present, and in the future and discuss how the problems are alike and different.

INTEGRATE

All subjects and intelligences will be integrated into all the activities.

ASSOCIATE

Small group activities include building model ships and holding a skimmer regatta. Whole group activities include listening to guest speakers, watching videos, holding discussions, and planning a veterans festival. Independent activities include research on specific types of naval vessels.

Generated Activities

ACTIVATE

- ☐ Students will study Iwo Jima, which the Navy played an important position in securing. They will view a documentary, then listen to a World War II veteran of Iwo Jima speak.
- ☐ Students will study Archimedes' method of foiling the enemy's naval defense.
- ☐ In groups, students will build plastic models of naval aircraft carriers, nuclear submarines, and destroyers.
- ☐ Students will study naval involvement in Desert Storm and ask questions of a guest speaker who participated in Desert Storm.
- ☐ Students will discuss what the Navy does during peacetime—its purpose and its pros and cons.
- ☐ Students will study engineering through a skimmer regatta. In groups, students will design and construct paper and straw skimmers and race the skimmers on tabletops.

DEMONSTRATE

Groups will present their skimmers to the class and explain their design before the actual regatta. Students will debate the pros and cons of Navy activity during peacetime.

COMMUNICATE

The class will host a Navy veterans' festival, where local veterans will visit to see displays made by students as well as memorabilia of other veterans. The class will have a question and answer time with these visitors to gather information for presentations on real-life naval veteran stories. These stories will be written in booklet form and placed in the local library.

SECTION IV

Voyages of Pleasure: Cruises

MOTIVATE

Play this game: Begin the game by saying, "I am going on a cruise to Alaska" (or another place name beginning with "A"). Students will continue, adding geographical names in alphabetical order and repeating the names already mentioned. Students will quickly realize they need to learn more geographical names. Allow students to use atlases to find and list geographical areas. Play the game again the following day, allowing students to bring along a list of places. As they name their destinations, point them out on a wall map.

INTEGRATE

All subjects and intelligences are integrated into the activities.

ASSOCIATE

Small group activities include planning cruises. Whole group activities include studying famous ports, listening to guest speakers, making soft-sculptures of cruise ships, and playing games. Independent activities include the create-a-cruise project and applying for a passport.

Generated Activities

ACTIVATE

- ☐ Students will make soft-sculpture cruise ships to hang from the ceiling of the classroom.
- ☐ Students will fill out passport applications and bring in a copy of their birth certificates for proof of identification.
- ☐ Students will listen to a travel agent guest speaker.
- ☐ Students will view a video of a cruise from a travel agency.
- ☐ Students will complete a create-a-cruise project. They will plan exciting cruises with a budget of $1,000 per port visited and create a travel diary, complete with pictures of the "trip"; an itemized budget of travel, food, souvenirs, film, clothing, and luggage; descriptions of cities and ports visited; a map of the trip; and a description of the ship and cabin.

DEMONSTRATE

Students will present create-a-cruise projects orally to the class.

COMMUNICATE

Students will display create-a-cruise projects for parents and other classes.

Grades 6–8

LEGACIES

by

Edna Yancey

The overall goals for this unit are the following:

- To acquaint students with the lives of three gifted individuals—Helen Keller, Anne Frank, and Christy Brown—who made tremendous contributions to the world
- To develop students' appreciation for their own gifts and the importance of giving to this world (leaving something behind)
- To create an awareness of the strong spirits of the disabled and their determination to overcome their obstacles in life
- To develop an appreciation of literature and film as gateways to learning about others

SECTION I

Helen Keller

MOTIVATE

The students will be given blindfolds and divided into pairs. One partner will wear a blindfold while the other leads him or her around the room. They will then change places. The students will thus experience being deprived of their sight, feeling helpless, and depending on others.

INTEGRATE

The unit infuses the use of literature, drama (acting activities), film (art form), and social studies. Each life is studied within its historical and cultural context. The literature written about them and the art form that developed as a result brings these individuals to "life" for the students. The acting activities give the students an awareness of the empathy and talent needed by actors and actresses to successfully portray these world contributors.

ASSOCIATE

Whole groups are used with the literature, social studies, and art form (film) strands. Small group and individual endeavors are employed with drama (acting activities).

ACTIVATE

Objectives: to examine Helen Keller's influential life and contributions to society; to explore how literature and art form (film) portray Helen Keller's life and give the reader or audience living images of her.

Generated Activities

- ☐ Excerpts from *The Story of My Life* (Keller, 1902) will be read to the class. The class will discuss these excerpts, and how they provide additional insight into her life and personality.
- ☐ The class will have a guest speaker from the School for the Blind. The students will be introduced to the fundamentals of braille and will be allowed to examine books written in braille.
- ☐ The students will choose parts and read aloud together in class *The Miracle Worker* (Gibson, 1985). A class discussion will follow each act of the three-act play.

- ☐ The students will be asked the following two questions: In literature (plays), we learn about the characters through the written word, but in film form how do we learn about them? How do actors develop their powers of observation, sensory recall, imagination, believability, and concentration? The class will discuss the answers to these questions, and the teacher will emphasize that it is through the actors' "gifts" (training activities, innate abilities, talent) that we learn about others. The class will be involved in acting activities designed to strengthen powers of imagination, sensory recall, concentration, etc.
- ☐ *Acting Activity* (sensory recall). The teacher will distribute a piece of candy such as a lemon drop or an orange slice to each student, with half of the class receiving one kind and the other half a different kind. For three minutes the students will quietly study the candy, being aware of every facet—shape, color, texture, smell, taste, sound, and the associations it calls forth. (Does the orange slice remind you of a seashell, a lady's hat, a Halloween adventure?) After three minutes the students will be asked to quickly write their impressions in phrases. The students will read their descriptions aloud and compare them with those of others. Which impressions are similar? Which are different?
- ☐ *Acting Activity* (sensory recall). The students will close their eyes and sit quietly for one minute listening to the sounds around them. After the minute is over, they will compare the sounds they heard.
- ☐ The video, *The Miracle Worker* (Aaron, Katz, Gallin, & Coe, 1981), will be shown in class. After the video, the class will discuss the differences (contrasts) between the play and the film. The teacher will stress the tremendous acting performances of Patty Duke and Anne Bancroft, and how the students' previous acting activities relate to the keen sensory awareness developed by Ms. Duke for her role as Helen Keller.

DEMONSTRATE

A culminating activity will occur at the end of the unit after all three individuals have been studied. It will be described after the investigation into Christy Brown's life.

COMMUNICATE

The culminating activity will be presented on stage to the middle school population (sixth, seventh, and eighth graders), parents, teachers, and administrators.

SECTION II

Anne Frank

MOTIVATE

The students will be asked to close their eyes and visualize being in a small, cramped attic with eight people. They cannot leave the attic, and no one must know they are hiding there. This situation lasts for two years. As a result of the visualization activity, the students will develop an empathy for Anne Frank's living conditions and frustrations.

INTEGRATE

The unit infuses the use of literature, drama (acting activities), film (art form), and social studies. Each life is studied within its historical and cultural context. The literature written about them and the art form that developed as a result brings these individuals to "life" for the students. The acting activities give the students an awareness of the empathy and talent needed by actors and actresses to successfully portray these world contributors.

ASSOCIATE

Whole groups are used with the literature, social studies, and art form (film) strands. Small group and individual endeavors are explored with drama (acting activities).

ACTIVATE

Objectives: to examine Anne Frank's young life and the period in history that brought it to an abrupt end; to explore how literature and art form (film) portray Anne Frank's life and give the reader and audience living images of her.

Generated Activities

- ☐ The video, *The Road to War* (Ross, Van Loon, Allen, & Bregstein, 1985), will be shown during the class period. After the video there will be a class discussion of the events leading up to World War II and the rise of Adolf Hitler.
- ☐ The video, *Hitler* (MPI Home Video, 1990), will be shown during the class period. After the video there will be a class discussion on the life and death of Adolf Hitler.

- ☐ The students will be presented with a historical chronology that correlates Anne Frank's life with the cultural and historical events of her time period. The students will discuss the time line and its importance.
- ☐ The students will choose parts and read aloud together *The Diary of Anne Frank* (Goodrich & Hackett, 1956). A class discussion will follow each act of the two-act play.
- ☐ *Acting Activity* (imagination). The teacher will introduce two acting activities using the imagination. It will be pointed out that the actors and actresses in the film version of *The Diary of Anne Frank* (Magnetic Video, 1979) had to develop and rely greatly on this innate ability.

  Activity one: The students will divide into groups of four or five and stand in a circle. They will walk around the circle responding to the teacher's coaching:

  - Walk leisurely, enjoying a warm summer day.
  - Walk briskly to be on time for an appointment.
  - Walk barefoot on hot burning pavement.
  - Walk barefoot on fine, hot sand.
  - Walk on slippery, smooth ice.
  - Walk barefoot in sticky, squishy mud that oozes between your toes.
  - Walk in shoes that are too small for you.
  - Walk on the moon with weightlessness.
  - Walk with your right foot stuck in a bucket.
  - Walk with a thumbtack stuck to your shoe heel.

  Activity two: The students will divide into groups of four or five and stand in a circle. They will handle and give a blackboard eraser to the person on their right as though it was the object the teacher suggests (e.g., a hot potato, a butterfly, a full cup of hot chocolate, a tiny puppy, a raw piece of liver). The students will be asked to really see, feel, and hear the article that they hold and pass, adjusting to the weight, shape, and size of the object.
- ☐ The video, *The Diary of Anne Frank* (Magnetic Video, 1979), will be shown in class. After the video, the class will discuss the contrasts between the play and the film. The teacher will stress the tremendous acting performances of Millie Perkins, Shelly Winters, etc., and how these actors and actresses developed keen imagination.

DEMONSTRATE

A culminating activity will occur at the end of the unit after all three individuals have been studied. It will be described after the investigation into Christy Brown's life.

COMMUNICATE

The culminating activity will be presented on stage to the middle school population (sixth, seventh, and eighth graders), parents, teachers, and administrators.

SECTION III

Christy Brown

MOTIVATE

The students will take off one of their socks and shoes. They will then try to hold a pencil or pen between their toes and write the word "mother" on paper with their foot. Through this activity the students will experience a sensory awareness of Christy Brown's disability.

INTEGRATE

The unit infuses the use of literature, drama (acting activities), film (art form), and social studies. Each life is studied within its historical and cultural context. The literature written about them and the art form that developed as a result brings these individuals to "life" for the students. The acting activities give the students an awareness of the empathy and talent needed by actors and actresses to successfully portray these world contributors.

ASSOCIATE

Whole groups are used with the literature, social studies, and art form (film) strands. Small group and individual endeavors are explored with drama (acting activities).

ACTIVATE

Objectives: to examine the life of Christy Brown and his contributions to the art world; to explore how literature and art form (film) portray Christy Brown's life and give the reader and audience living images of him.

Generated Activities

- ☐ The students will be presented with a historical chronology (time line) of Ireland. The students will discuss the time line, specifically the 1930s and 1940s, which were Christy Brown's childhood years.
- ☐ The class will have a guest speaker who is an "expert" on cerebral palsy. The students will be informed of the cause and treatment of this disabling disease. They will be shown specific physical therapy techniques used to help strengthen those afflicted with this disability.
- ☐ The students will choose parts and read aloud together *My Left Foot* (Connaughton & Sheridan, 1989). A class discussion will follow after reading the play.
- ☐ *Acting Activity* (concentration). The teacher will introduce two acting activities involving concentration. Emphasis will be placed on the intense preparation and devotion of the two actors, Hugh O'Conor and Daniel Day-Lewis, who portrayed the child and adult Christy Brown respectively. The students will divide into pairs. The teacher will give one partner a sentence to use to start a quarrel. (Sentences might include: Where have you been? I've been waiting for you. You never like any of my friends. Turn off that T.V. Why do you always wear brown? You are driving too fast. You are always eating—munch, munch, munch.) Each couple must carry on the argument, determined not to give in to his or her partner. The couples should begin their quarrel in control and finally lose their tempers. At the end of one or two minutes, the teacher will call "cut."
- ☐ *Acting Activity* (concentration). The teacher will assign each student a partner and allow them a few minutes to decide on a situation in which each wants to buy the same article in a store. The problem is that the store has only one of the articles left and neither partner is willing to give in to the other. (Suggested articles might include a front room chair in a furniture store, an evening gown in a dress shop, a pair of shoes at a shoe store, or a puppy at a pet shop.) The students do not plan together what they will say or do, but only where the scene takes place and what the article is that they both want. Each student is allowed time to develop his or her own secret plan of attack on how to get the article from his or her partner. Then each couple presents their conflict to the class.

- ☐ The video, *My Left Foot* (Heller, Morrison, Pearson, & Sheridan, 1990), will be shown in class. After the video, the class will discuss the differences between the play and the film, and the superb acting performances of O'Conor and Day-Lewis.

DEMONSTRATE

The students will divide into groups of four to six. They will be asked to choose a favorite scene from one of the three plays or movies they have read or seen *(The Miracle Worker, The Diary of Anne Frank,* and *My Left Foot)*. They will act out this scene with all necessary props, scenery, and costumes.

COMMUNICATE

The culminating activity will be presented on stage to the middle school population (sixth, seventh, and eighth graders), parents, teachers, and administrators.

Grades 7–9

LEADERSHIP

by

Edna Yancey

Overall Goals

Students will gain insight into the fundamentals of leadership and develop advanced research, planning, and organizational skills.

MOTIVATE

Pictures of famous leaders will be placed around the room. The students will be asked the following questions: What do you know about leaders and leadership? What makes a person a leader? Are you a leader? What would you like to know about leaders and leadership? How can we learn about this concept? How can we evaluate our learning? A class discussion will follow on the importance of examining leaders and the concept of leadership in all subject areas.

INTEGRATE

The unit infuses the use of social studies, science, math, and literature. Leaders from all walks of life are presented and examined. The personal qualities and skills that denote leadership are explored.

ASSOCIATE

Whole groups, small groups, and individual endeavors are interwoven throughout the unit.

ACTIVATE

Focusing Questions: What are the positive personal characteristics common to all leaders? What are the skills necessary for effective leadership? What are the types of leaders and leadership styles?

Generated Activities

- ☐ Students will be asked to write their own definitions of a leader and leadership. They will discuss their definitions noting the differences between "leader" and "leadership" and come up with class definitions. They will then compare their definitions with those in a dictionary.
- ☐ Names of famous leaders will be placed around the room. The students will discuss the personal characteristics of each leader. A list of personal positive characteristics common to all leaders will be developed.
- ☐ The class will be divided into several small groups of four to six students. A group discussion leader will be elected. Each group will be assigned a case study that describes how the negative personal characteristics of a leader influence a situation. The groups will be asked to read and discuss their case studies and answer the following four questions:
  - What is the true problem?
  - What are the important facts to be considered in the problem?
  - What are several solutions?
  - Which solution does your group recommend? Why?

  When all groups have finished, each group will describe its case study to the class and give answers to the four questions.
- ☐ An inventory that describes the personality traits of a leader will be given to the students. After taking the inventory, students will be asked to list their strongest and weakest traits. They will then be asked to formulate goals that would help to strengthen their weakest traits. A

class discussion will follow on suggested ways to develop personal characteristics for leadership.

- ☐ Students will divide into groups and will be asked to design a bulletin board for the leadership unit. They will sketch their bulletin boards on large sheets of paper. One member of each group will present the design to the class. After the activity, there will be a group discussion and the following questions will be asked:
  - Did the group have one leader or several leaders?
  - How could you tell someone was the leader?
  - How were the leaders different?
  - How were they alike?
  - If the group had more than one leader, why did the leader change?
  - How was the leader able to influence you?

  After the activity and group discussion are over, the bulletin board designs will be placed around the room.

- ☐ The students will be presented with two emergency situations where a leader is needed. One of the situations presented will have people in it who clearly could assume leadership roles; the other situation will have no clear identifiable leaders. The class will divide into groups and will be asked to identify whom they think the leader(s) would be in each emergency situation. They will have to justify their reasoning.

- ☐ The students will discuss the difference between influence and power in relation to the leadership role. They will be asked to give examples of power and examples of influence.

- ☐ The students will discuss propaganda techniques that leaders use. They will divide into groups of four and will be asked to act out some of the techniques in the form of a radio or television commercial.

- ☐ The students will brainstorm categories of leadership such as medicine, government, etc. They will then divide into groups of five and formulate titles of individuals that would fit into each group. The students will then take the leadership titles and outline the various duties of each leadership position. One or two members from each group will report to the class on their findings. Following this activity, the class will discuss how important it is for any leader to possess certain skills such as decision making, written communication, oral communication, group dynamics, and planning.

- ☐ The students will be given the Leadership Skills Inventory (Karnes & Chauvin, 1985), which is a self-administered, self-scored inventory of leadership skills. After completing the inventory, the students will be

able to determine their strengths and weaknesses in each of the areas. Then they will complete the accompanying profile sheet that graphically identifies the areas in which additional skill development is needed.

- ☐ Information about the different categories of leaders will be presented to the class. These categories will be discussed. The students will then read and review six biographies of different types of leaders. The students will classify each leader and cite passages in the texts that support the classification.
- ☐ Information about leadership styles will be presented to the class. Each style will be discussed. Three students will be selected and instructed to role play one of the leadership styles. The others will not be told the leadership style portrayed. The students not involved in the role playing will act as observers to determine the leadership style enacted.
- ☐ The students will be presented with fictitious problems and asked to describe how they would solve them. An analysis of the methods each student would use will be undertaken to help the student identify his or her own leadership style. Different types of problems will be presented so students can see that different styles of leadership are necessary in different situations.

DEMONSTRATE

The students will be asked to choose a leader of interest. They will read biographies, autobiographies, and magazine and newspaper articles about their chosen leader. They will then be asked to prepare an oral report that analyzes the individual's leadership role and style, personal qualities, and skills. The students may dress as their leader would dress, impersonate their leader (reporting from the use of "I"), and use as many visual aids as they desire to make their leader come "alive" for their audience.

COMMUNICATE

The oral report will be presented to students' peers.

Grades 10–12

WRITING AND SCIENCE CURRICULUM

by

Matilda W. Buchanan

Why try a different approach to the teaching of writing?

Research over the past thirty years has shown us that teaching grammar isolated from writing does not teach either grammar or writing, but when the teaching and learning experience is centered on writing, students learn both writing and grammar. James L. Kennedy, professor of writing at the University of Texas at Austin and author of numerous books about the teaching of writing, gives a succinct but superb rationale for creating a writing program based on student needs, "Babies see that family members around them accomplish things by using language, and they quickly learn to use it themselves to get food, drink, or attention. This is the motivation behind all language acquisition and usage, from cradle to grave—language gets things done" (Warriner & Kennedy, 1993, p. 458–459).

Although there are seven units in the writing lab curriculum, only one unit will be presented as an example for this text.

The following are objectives for this unit:

- Students will understand the differences between several types of scientific writing and will develop skills in reading and evaluating them.
- Students will understand the purpose of scientific experimentation in a standardized manner by writing correct lab reports and science fair reports, including the statement of purpose, the hypothesis, and the introduction.
- Students will review accepted methods of writing bibliographies and use parenthetical documentation.

MOTIVATE

The "writing inventory" will allow the student to record his or her initial feelings about the writing process and give the lab instructors an idea of the types of writing experiences that the student has had. Questions on the inventory include:

- What kinds of writing have you done in the past?
- What do you like to do most/least in writing?
- What kinds of writing will you most probably be expected to do in the future?
- Where do you get ideas for your writing?
- What do you think is important to know about you as a writer?
- How might writing assist you to reach your personal and professional goals in science?

INTEGRATE

A writing lab course should be a complete hands-on, individualized writing class. Early assignments will assess ability and ensure mastery of fundamental writing forms (the three point theme, comparison/contrast, etc.) and diagnose and correct individual weaknesses in mechanics and syntax. More advanced assignments will deal with advanced rhetoric and persuasion. However, most of the class will be devoted to students completing writing assignments from mathematics, biology, chemistry, physics, history, literature, and foreign language. These assignments will range from lab reports and short analytical papers to full-length research papers and the preparation of scientific data and research.

Writing assignments based on the students' needs in other courses will be coordinated and constructed by the writing lab instructors. The assignments will be generated by the lab instructors analyzing writing assign-

ments provided by the other subject area teachers. Examples might be an essay answer from a math test or a lab report from biology.

ASSOCIATE

Whole groups, small groups, pair-share, and individual endeavors are interwoven throughout the units.

Generated Activities

ACTIVATE

- ☐ Students will read and discuss pages 458–459 in *Elements of Writing* (Warriner & Kennedy, 1993). They will also read and evaluate two science articles—"Are the Cytosolic Components of the Nuclear, ER, and Mitochondrial Import Apparatus Functionally Related?" and "How the Immune System Recognizes Invaders"—from the first chapter of *Lives of the Cell* (Thomas, 1974).

  In their evaluation they will do the following:

  - Create a correct bibliographical entry for the article.
  - Summarize the article in one paragraph.
  - Imagine what type of science fair project the article could be used for. What might the title of the project be?
  - Rate the difficulty of the article from easy to very hard.

- ☐ Students will discuss the two article evaluations before submitting them for a grade.
- ☐ Students will go over "Getting Started" (from *Lives of the Cell* textbook, p. 84) for a science fair. They will discuss the steps involved in the first two parts. They will write an introduction that surveys the literature and history of their topic, a null hypothesis, and an alternate hypothesis.
- ☐ The teacher will pass out sample introductions and hypotheses. The students will discuss characteristics of a good introduction and hypothesis.
- ☐ Students will complete a rough draft of their introduction and null hypothesis/alternate hypothesis.
- ☐ Students will choose an editing partner. Using previously learned editing techniques and the agreed upon criteria for good introductions and hypotheses, students will edit and critique each other's work.

- ☐ Students will revise edited drafts and complete a final "clean copy" with a bibliography by the end of the class period.
- ☐ Students will take turns formally presenting their problems, reading aloud their introductions and hypotheses to the class. The audience will complete a written critique of the presentations, including problems they perceive in the implementation of the experiment.

DEMONSTRATE

The comprehensive evaluation of the writing lab includes tests and portfolio assessment. Each step in the writing process will be evaluated and will contribute to the student's final grade. The final grade for assignments prepared for another class will be determined by the teacher in that class. However, a separate grade may be given by the writing lab instructor based on the function of the assignment within the curriculum of the writing lab. The portfolio will function as an organic means for students to assess their growth as writers and reflect on the writing process.

In the "biography of a work," the student will record all steps in a particular writing process including changes made in him or her as a writer because of the assignment. The final product will be a formal science fair paper based on research and data produced in science class.

Getting Started for a Science Fair (from *Lives of the Cell*, Thomas, 1974, p. 85)
Science Fair: Problem, Hypotheses, and Introduction

1. Clearly state the problem or question you intend to investigate.
2. Write both null and alternate hypotheses.
3. Write an introduction in which you define terms and concepts, survey the history of research for this problem and/or related problems, and set up your hypotheses and experiment. Make sure you cite and quote from the research you use in your bibliography.
4. Write a correct bibliography for your research.
5. Have two editors proof your work and sign their edited copies. (Note: Editors might read for evidence of 1–4 above as well as clear, correct writing.)
6. Correct and turn in a final copy to the writing teacher and another final copy to the science teacher.
7. Begin a rough outline of your methods and experiment. Make sure you thoroughly think through how you will measure your experiment.

COMMUNICATE

The science fair paper will be presented orally to judges and peers. The audience becomes a continuum of avenues that includes the community, the school structure, the world of the adolescent's peers, and parental influences.

CONCLUSION

Sufficient evidence now suggests that the teaching of thinking is not another fad. What remains to be clarified is *how* to teach students to use their minds well. The medical and scientific communities have offered evidence on a variety of brain functions that have important links to the teaching of thinking. While our knowledge is admittedly incomplete, there is conclusive evidence that the brain continually remodels itself. Consensus shows that the brain searches for meaning through patterning and that this search is innate.

The educational community must examine the evidence on brain research and review methods of teaching thinking to accommodate the brain's natural tendency to learn.

The Brain Decade of the 1990s has indeed raised the public's awareness of the need to understand our organ of thought. Now the educational community's task is to incorporate the foundation provided by neuroscience to benefit students of the 21st century.

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There are
one-story intellects,
two-story intellects, and three-story
intellects with skylights. All fact collectors, who have
no aim beyond their facts, are one-story men. Two-story men compare,
reason, generalize, using the labors of the fact collectors as well as their
own. Three-story men idealize, imagine, predict—
their best illumination comes from above,
through the skylight.

—Oliver Wendell
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CATCH THEM LEARNING

Educators understand that teaching methods and techniques come and go, and philosophies and theories change. But Mary Prentice, the author of *Catch Them Learning: A Handbook of Classroom Strategies*, feels that the current movement promoting the explicit teaching of thinking skills is here to stay. She contends that instructing students *how to learn and think* is critical in a world where technology changes at an incredible rate. Teachers must provide students with the tools and skills they need to be successful in the next century.

Catch Them Learning: A Handbook of Classroom Strategies is a superb resource for teaching thinking skills within content areas. Part One covers six components of interaction in an easy-to-follow chapter format, and includes both teacher-initiated activities and student-centered responsibilities. The first three chapters highlight the key elements of **teaching**—to *motivate* students to think, to *integrate* the curriculum, to help students *associate* in groups. The next three chapters highlight the key elements of **learning**—to *activate* the process, to *demonstrate* thinking and learning skills, and to *communicate* new knowledge to others.

Part Two includes sample lessons directed at students from kindergarten through high school. Each lesson demonstrates how to integrate the curricula, teach to the student's multiple intelligences, and develop higher-order thinking skills. Lessons include "Our World of Change," "The Horse Course," "Michelangelo is Not a Turtle," "Voyages Into Learning," "Legacies," "Leadership," and "Writing and Science." This teacher-friendly guide is a must for every educator's library!

Mary Prentice, Ph.D.

Mary is a faculty member at the University of Arkansas in Little Rock. She is the founder and former managing editor of the *Arkansas Gifted Educators Magazine* which provides teachers and national experts the opportunity to share their work. In 1987 Mary was awarded the Arkansas Gifted and Talented Challenger Award in honor of her creativity and innovation. She received the Outstanding Teaching Award from both the college of Education and the University of Arkansas at Little Rock in 1990. In addition to teaching, Mary travels extensively and works as a consultant and speaker.

ISBN 0-932935-79-6
90000
9 780932 935793

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